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# INDEX OF SUBJECT MATTER

## COLLECTIVE REVIEWS

The Vermiform Appendix. <i>W. Frank Fowler, M.D., Rochester, N.Y.</i> .....	I
Relation Between Gynecological and Neurological Conditions. <i>Richard R. Smith, M.D., F.A.C.S., Grand Rapids, Michigan.</i> .....	117
Congenital Malformations of the Neck. <i>George de Tarnowsky, M.D., F.A.C.S., Chicago.</i> .....	217
The Surgery of Glaucoma. <i>Emory Hill, A.B., M.D., Chicago.</i> .....	333
Present Status of Round Ligament Shortening as a Surgical Cure in Uterine Displacement. <i>Sidney A. Chalfant, M.D., F.A.C.S., Pittsburgh.</i> .....	433

## ABSTRACTS OF CURRENT LITERATURE

- A** **B**DERHALDEN reaction, Quantitative test of, 78
- Abdomen, Use of fluoroscope to avoid leaving gauze pads and sponges in, 127; Penetrating wounds of, 242, 243, 244; Acute surgical, 245; Extraction from, of bullet encysted in epiploon after injury, 362; Chronic, and acute, 362; Wounds of, by war projectiles, 363; Menstrual fistula of, 404; Value of pain, jaundice, and tumor mass in differential diagnosis of diseases of right upper quadrant of, 470; Gunshot wounds of, in pregnant women, 507
- Abdominal, Perforations of various, organs, 130; Nerve supply of lower, wall as related to Pfannenstiel incision, 228; Symptom and complications of gunshot wounds of solid, viscera, 246; Care of, surgical cases, 247; Sympathetic system in diagnosis of, diseases, 400; Sheet rubber superior to gauze sponges in, operations, 535; Nerve-blocking as practical method of anesthesia for, operations, 536; pain when associated with abnormal temperature an indication for caution in use of purgatives, 549; Relation of ether pneumonia to pelvic and, surgery, 593
- Abdominal wounds, Gunshot, 30; in war surgery, 137; and their treatment, 138; Evolution of treatment of, in ambulance at front, 138; Treatment of penetrating, in ambulance, 363
- Abortion, Duties of medical practitioners in criminal, 68; Uncontrollable vomiting of pregnancy, 177; Accidents due to rupture or, of simultaneous tubal pregnancies, 177
- Abscess, Cerebral, due to suppurative tonsillitis, 131; Retropharyngeal, discharging into left bronchus, 196; of lung after tonsillectomy, 196; Conduction anesthesia in brain, 234; Ischiorectal, from fish-bone, 259; of kidney cortex and its relation to paranephritic suppuration, 416; Lung, following tonsillectomy, 516
- Absorption of adrenalin after intratracheal injection, 489
- Accessory sinuses, Diseases of, of nose, 314; Diagnosis and treatment of inflammatory affections of nasal, 427; Radiography in diagnosis of diseases of nasal, 428
- Accident insurance, Breaking of stitches and opening of wound not covered by, 170
- Acidosis, in surgery, 275, 573; in normal subjects with incidental observations on action of alcohol as an antiketogenic agent, 385; Pregnancy toxæmia, in pregnancy, 504; complicating, 597; Routine treatment of operative, 535
- Acne vulgaris, Vaccine therapy and other treatment in and furunculosis, 481
- Actinomycosis cured with radium, 580
- Acute, dilatation of the stomach complicating operations on extremities, 127; Chronic and, abdomen, 362
- Adenitis, Treatment of tuberculous, by roentgen rays, 389
- Adenocarcinoma of cerebellum, 356
- Adenoids, Removal of tonsils and, in diphtheria carriers, 98
- Adenomata, Functional significance of mitochondria in toxic thyroid, 450
- Adenomyoma, of rectovaginal septum, 405, 594
- Adhesions, Peritoneal, prevention with citrate solutions, 31, 32; Intraperitoneal, 549; Time relations of gastric pains with reference to gastric, 249; Intestinal, 255
- Adnexa, Technique by which conservatism is made possible in diseases of, 174; Technique of new procedure for subtotal abdominal hysterectomy in uterine fibroma or inflammation of, 296
- Adrenals, Gastric ulcer following removal of, 33; problem, 284; Liberation of epinephrin from, by stimulation of splanchnic nerves and by massage, 284
- Adrenalin, Absorption of, after intratracheal injection, 489
- Aerocele, Intracranial, 130
- After-treatment, Immediate and, of railway injuries, 228; of amputation stumps, 268; Simple, for perineal wounds, 301
- Agglutination, Further observations on, of bacteria in vivo, 579
- Albee operation, Experience with, for spondylitis tuberculosis, 477
- Alcohol, Acidosis in normal subjects; action of, as an antiketogenic agent, 385
- Alkali reserve, Method for determination of, of blood-plasma, 482
- Alternatives to operation of colotomy, 463
- Ambard's constant, 86
- Ambulance, Working of clearing, 398
- Amputation, Functional status of, stumps in war, 148; Prevention and treatment of, 152; at base hospitals in France, 267; After-treatment of, stumps, 268; Flapless, 268; Partial, of foot for gunshot wounds, 375; of penis for carcinoma; conditions after operation, 422
- Anæmia, Blood-transfusion in treatment of severe post-hæmorrhagic, and hæmorrhagic diseases, 279; Treatment by splenectomy of splenomegaly with, associated with syphilis, 557; Metabolism studies before and after splenectomy in pernicious, 560

- Anæsthesia, Local, and analgesia, 18; and general, 19; Spinal, 19, 230, 446; Caudal, in genito-urinary surgery, 19; Analgesia and, in obstetrics, 81; Tonsil operation under, 98; Appendectomy under, 258; in otorhinology, 231; Method of facilitating infiltration 349; Rectal, 349
- Anæsthesia, General, Use of warmed ether vapor for, 129; Shockless surgery with help of paravertebral, with scopolamine and narcophine, 231; Conduction, in brain abscess, 234; Intravenous injection of magnesium sulphate for, in animals, 386; in labor, 411; Scopolamine-morphine, in labor, 507; Nerve-blocking as practical method of, for abdominal operations, 536; Organic depression of nerve-cell produced by prolonged ether, 578
- Anæsthetics, Inhibition of toxicity of, for nephropathic kidney, 128; Choice of, and general analgesia in surgery and in obstetrics, 307; Influence of, on temperature of body, 446; Handling of children with tuberculosis of spine while they are under influence of, 480; Nitrous oxide-oxygen the most dangerous, 536
- Anal, Genito-urinary symptoms arising from, rectal and colonic diseases, 93
- Analgesia, Anæsthesia and, 18; and anæsthesia in obstetrics, 81; Obstetrical, by epidural injections of novocaine, 411; Parto-, 413
- Analgesics, in parturition, 307; Choice of anæsthetic and general, in surgery and in obstetrics, 307; in parturition, 411
- Analysis, Cytological, of shock, 578
- Anastomosis, End-results of entero-biliary, 37; Intradural nerve in poliomyelitic paralysis, 571
- Anatomy, and pathology of seminal vesicles, 90; and surgery of thyroid glands, 449; Pathologic, of immediate lesions in penetrating cranial fractures due to projectiles, 538
- Anatomical, cause of frequency of hydrocephalus in childhood, 448; position of localized foreign bodies, 492
- Aneurisms, of war wounds, 56; Cirroid, 57; Epicrises in wound, 57; Treatment of femoral, 162; Gunshot arteriovenous, in which sac was situated on side opposite the vein, 280; Arteriovenous, of axillary artery, 380; of dorsalis pedis artery, 280; Diagnosis, symptomatology, and therapy of dilatation, of descending thoracic aorta, 280; Choice of operation in cure of, of extremity, 281; Traumatic, 380; Treatment of accessible arterial, 484; Diagnosis of, of descending aorta, 576
- Angiitis obliterans, Presenile gangrene-thrombo-, 483
- Angiogenesis, Relation of, to ossification, 73
- Angioma of larynx, 517
- Angioneurotic edema, Visceral crises in, 245
- Angulation and flexure, Acute, of sigmoid, 463
- Ani, Prolapsus, in adults, 466; Pruritus, 555
- Ankylosis following gunshot injuries of joints, 270
- Ano, Observation on fissure in, 466
- Anomalous development, Giant ureteral calculus, of genito-urinary tract, 510
- Anorectal, fistula, 259; injuries, 465
- Anteflexion, Dysmenorrhœa with, and retrocession, 590
- Anterior poliomyelitis, Operative treatment for disabilities and deformities following, 477
- Anthrax, 164
- Antiseptic, Surgical and, values of hypochlorous acid, 17; Hexamine as urinary, 189; Method of testing, for wounds with some results, 230; action of ether in peritoneal infections, 248; Method of action of certain, and procedures for determination of their therapeutic value, 348
- Antitoxin, Prophylactic use of tetanus, 282
- Aorta, Diagnosis, symptomatology, and therapy of dilatation aneurisms of descending thoracic, 280; Diagnosis of aneurisms of descending, 576
- Aperiosteal stump and its care, 476
- Apparatus, Resuscitation, 537
- Appendix, Cystic dilatation of vermiform, 143; Roentgen examination of, 256; Fibroid degeneration of, 256; Pathological diagnosis of diseases of, 459; Treatment of retrocecal, 462
- Appendectomy under local anæsthesia, 258
- Appendicitis, 368; Acute, 35; Urticaria and pseudo-, 67; Pseudo-, 552; Salpingitis secondary to, 74; Diagnosis of, in childhood, 143; Neglected, high mortality; diagnostic and therapeutic responsibility, 257; Time for operating in acute, and gall-bladder disease, 258; of extra-appendicular origin, 367; Prevention of fecal fistula in suppurative, 368; Treatment of suppurative, 462; Results of treatment of acute, 368; False, in pregnancy, 410; Gestation complicated by, 597; Morphine as early diagnostic element in acute, 461; Leucocyte count of, 461; Radiodiagnosis of, 552
- Application, Practical, of blood-pressure findings, 160
- Arch of foot, Painful anterior, operation for relief by raising arch, 269
- Arrested development of carpus and tarsus, 263
- Arsenic, Lethal dose of, for splenectomized mice, 580
- Artery, Aneurism of dorsalis pedis, 280
- Arteries, Embolism in, 575; Fractures of, 575
- Arteria meningea media, Intracranial hæmorrhage due to traumatic rupture of, 22
- Arterial, Treatment of accessible, aneurisms, 484
- Arthritis, Retarded ossification as etiologic factor in traumatic, and epiphysitis, 40; Treatment of purulent, of knee by arthroscopy or marsupialization of synovial sac, 40; Rôle of visceroptosis in, deformans, 145; Neck resection in secondary period of traumatic, 357; Osteo-, 472; Treatment of traumatic, of knee, 567
- Arthritis: See also Joints
- Arthrodesis, Subastragalar, in lateral deformity of paralytic feet, 153, 478
- Arthroplasty of interphalangeal joints, 265
- Articular gunshot wounds, 563
- Ascites, Chylous, and chylothorax due to carcinoma of stomach, 454; Chylothorax, chylous, and lymphosarcoma, 454
- Astragalus, Fracture dislocation of, 372
- Astragalectomy; Result of, in infantile paralysis, 153
- Atresia, Congenital, of duodenum treated by operation, 365; Complete congenital, of ileum, 458; Late conservative cesarean operation with vertex presentation for cicatricial, of vagina, 504
- Aural complications of influenza, 94
- Auscultation in diagnosis of vascular injuries accompanying gunshot wounds, 281
- Autoplasty, Venous, of traumatized urethra, 191
- Axillary artery, Arteriovenous aneurism of, 380
- Axis, Fracture of odontoid process of, 156
- B**ACCELLI'S method, Malignant pustule treated by, 378
- Bacillus pyocyaneus, Chronic general infection with, 58
- Bacillæmia, Tubercular, a clinico-experimental study, 388
- Back, Surgical aspects of painful, 272; Injuries of lower, 569
- Backache, Chronic, 156; from viewpoint of orthopedist, 480
- Backward, Treatment of, displacements of uterus, 500
- Bacteria, Demonstrating, in urine by centrifuge; relative value of examinations by culture or stained sediment, 84; associated with certain types of abnormal lymph-glands, 162; of gangrenous wounds, 283; Agglutination of, in vivo, 579



- Bactericidal, Reactions between bacteria and animal tissues under conditions of artificial cultivation, action in tissue cultures, 163; Nature of, property of vaginal secretion, 592
- Bacteriologic, and experimental studies on gastric ulcer, 486; study of causes of some stillbirths, 509
- Bacteriology, and experimental production of ovaritis, 300; of nasal sinus disease, 516
- Basal metabolism in disease and its importance in clinical medicine, 573
- Beck-Pierce, Tonsil enucleations with, tonsillectome, 431
- Beclard and Pirogoff, Ligature of lingual artery in triangles of, 197
- Benign growths, Malignant transformation of, 465
- Bergonie electrovibrator, Extraction of projectile from brain with use of, 131
- Bile-duct, Pressure of bile secretion during chronic obstruction of common, 144; End-to-end suture of, 371; Congenital obliteration of, diagnosis and suggestions for treatment, 469
- Biliary passages, Surgery of gall-bladder and, 556
- Birth, Injuries to infant produced at, 82; Obstetrical or brachial, palsy, 509; Posterior dislocation of lower humeral epiphysis as, injury, 604; Beginnings of, control movement, 605
- Bismuth paste, Unusual fecal and genito-urinary cases treated by, 514; in chronic suppurative sinuses and empyema; incorrect technique in its application, 545
- Bladder, Makka's operation for ectopia of, 89; Cauterization and fulguration of, tumors, 89; Vesical fistula due to permanent foreign body in, 189; Extraction of bullets from, by natural route, 419; Foreign bodies in, resulting from gunshot wounds, 420; Oedema bulbosum of, 189; Fatal rupture of, during puerperium, 305; Rupture of, associated with fracture of pelvis, 512; Treatment of gunshot wounds in, 420; Manual expression of, in spinal injury, 421; Hernia of urinary, 512; Treatment of, injuries by war projectiles, 610; Injuries of, and urethra in war, 609
- Blood, Association of spleen with liver and relation to certain conditions of, 38; and blood-vessels in hæmophilia and other hæmorrhagic diseases, 53; Prothrombin and antithrombin factors in coagulation of, 161; Disappearance of dextrose from, after intravenous injection, 277; Testing donors for transfusion of, 279; Behavior of pancreatic ferments in, after ligation of pancreatic ducts, 286; Importance of lymphocytosis of, 378; Non-protein nitrogenous constituents of, and phenolsulphonephthalein test in children, 483; ferments in pregnancy, 506; Lipoid content of maternal and foetal, 508; Value of determination of cholesterol content of, in diagnosis of cholelithiasis, 556
- Blood: See also Embolism, Transfusion, Thrombosis, Hæmorrhage
- Blood-cells, Preservation of living red, in vitro, 52, 56
- Blood-plasma, Method for determination of alkali reserve of, 482
- Blood-pressure, Systolic, in pregnancy, 80; in dysthyroidism, 134; Practical application of, findings, 160; during operations, 574
- Blood-transfusion, 279, 379; Reactions following, by syringe cannula system, 55; Indications for, 278; in treatment of severe post-hæmorrhagic anemia and hæmorrhagic diseases, 279; Direct, with Kimpton-Brown tubes, 280; in hæmorrhage of newborn, 604
- Blood-vessels, Injuries of large, in war, 57; Reactions of, to certain chemicals, 488
- Blue sclerotics; their relation to multiple fractures in childhood, 472
- Bone, repair, 265; General heliotherapy in treatment of, and joint affections, 265; Use and limitations of stereoscopic radiograms in diagnosis of injury to, after-treatment of fractures, 287; Regeneration of long, following infection, 472; Treatment of abscesses in tuberculous disease of joints and, 475; Value of roentgenology in treatment of, and joint tuberculosis, 581; Osteoperiostic grafts taken from tibia to serve in reconstruction of, or in repair of loss of osseous substance, 476; Regeneration of, 561
- Bone: See also Fractures, Graft, Transplantation
- Bone-graft, Pott's disease treated by, 44; for spinal conditions, 47; Autogenous, pin in treatment of painful flat-foot and paralytic valgus, 266
- Bone-graft: See also Transplantation
- Bone-peg, Heterogenous, 266
- Bone-plate, Cranioplasty; metallic, cartilaginous or by, 131
- Bone-splints, Autogenous, in fractures and tuberculous spines, 568
- Bone-transplantation, in nose deformities, 21; in ununited fractures of shaft of humerus, 264, 568; Important points in, 476; and some uses of bone-graft, 568; Treatment of caries of spine by, 570
- Bony union in intracapsular fractures of hip-joint, 146
- Bowel, Simple method of giving solutions by, 229
- Brachial plexus, Operative treatment of, paralysis, 157
- Brachial birth palsy, Obstetrical or, 509
- Brain, Extraction of projectile from, with Bergonie electrovibrator, 131; Movements of foreign bodies in, 448; Conduction anaesthesia in, abscess, 234; abscess from chronic suppuration of frontal sinus, 615; Diagnosis and treatment of, injuries in adults, 355; Tumors of hypothalamic region of middle, 355; Teratomata of, 540; Process of cicatrization of open wounds of, 541
- Branchiogenic carcinoma, 541
- Breast, Tuberculosis of, 358; Anatomic study of lymphatics of, from viewpoint of lymphatic extension of cancer, 542
- Breast, Cancer of, 239, 358; Early diagnosis of, 450
- Breast, Carcinoma of, Vertebral metastatic primary, 376; Relation between chronic mastitis and, 451
- Broad ligament, Infolding and peritonealizing stitch with application of same to, and gall-bladder, 346
- Bronchus, Paper clip in, seventeen years removed by superior bronchoscopy, 195; Retropharyngeal abscess discharging into left, 196; Carcinoma of oesophagus perforating into right, 453; Endothelioma of right, removed by peroral bronchoscopy, 547
- Bronchi, Removal of foreign bodies from oesophagus and, with description of new instruments, 242
- Bronchiectasis, Therapeutics of chronic non-tuberculous suppurative, 546; and bronchiectatic symptoms due to foreign bodies, 547
- Bronchoscopy, Paper clip in bronchus seventeen years removed by superior, 195
- Bubo, Cure of suppurated cancerous, by filiform drainage, 275
- Buccal mucosa, Melanosarcoma of, 517
- Bullet, New method of, extraction, 228; lesions of cauda equina, 270; Removal of, and metallic foreign bodies, 289; Finding of position of retained, 391; Extraction of free, from left pleura after establishment of artificial pneumothorax, 452
- Bunions, Plasterers' corns and, 145
- Burden of proof in actions for negligence, 495
- Burns, Treatment of, 159; Gas, 384
- Bursitis, Deposit in supraspinatus muscle simulating subacromial, 41



# CACHEXIA of hypophyseal origin, 378

- Cesarean section, 407; in Pitman's cottage, 79; Indications for high incision in, 79; Delivery by natural passages following, 178; by modified Davis operation, 303; high forceps; pituitary extract, 303; Transperitoneal suprasymphysal, on account of scariform growth in vagina, 304; performed with pocket knife after death of mother resulting in normal and living child, 505; Segmental, 408; Foetal dystocia and, 410; Late conservative, with vertex presentation for cicatricial atresia of vagina, 504; Postmortem, 505; Rupture of scar of previous, 506
- Calcareous degeneration of prostate gland, 423
- Calcification, Relation of angiogenesis to ossification based on study of, and ossification of ovary, 73
- Calculus, of Wharton's duct, 353; Diagnosis of ureteral, 419; Giant ureteral, anomalous development of genito-urinary tract, 510
- Calculi, in submaxillary gland and Wharton's duct, 21; Problems in X-ray diagnosis of urinary, 89; of vesicoprostatic region in old prostatics, 423; Unilateral hæmaturia associated with fibrosis and multiple microscopic, of renal papillæ, 510; Ureteral, 607
- Cancer, Aids in diagnosis of surgical conditions of stomach with especial reference to characteristic X-ray appearance of syphilitic hour-glass in contrast to simple ulcer and, 32; Radical operation for, of rectum and rectosigmoid, 36; Etiology and prophylaxis of, 50; Pathological aspects of some problems of experimental research, 60; Roentgen treatment of deep seated, 62; Unrecognized syphilitic lesions surgically operated as, or as local tuberculosis, 67; subjected to surgical ionization, 158; Tissue cultures in investigation of, 273; Effects of, tissue and normal epithelium on vitality of protozoa, 273; Intra-ocular, sarcoma of choroid, 312; Use of heat in control of inoperable, 408; of mouth and tongue with reference to metastases in neck, 517; Diagnosis of, of rectum, 554; as non-surgical disease, 571; Superheated steam in treatment of superficial, 572; Therapeutic value of radium in pelvic, 580
- Cancer of breast, 239, 358; Hypophyseal disorder in, and relation to diabetes insipidus, 135; Early diagnosis of, 450; Anatomic study of lymphatics of breast from viewpoint of lymphatic, 542
- Cancer of cervix, Primary and end-results in inoperable, treated by cautery method, 173; with especial reference to combination method of treatment, 498
- Cancer of stomach, Etiologic relationship existing between gastric ulcer and, 140; Serious œsophagic spasms in, 362; Diagnosis of, 551
- Cancer of uterus, 588; Prophylaxis of, 173
- Cancer: See also Tumor, Carcinoma, Sarcoma
- Carbolic injections, Mental symptoms complicating acute tetanus during treatment by, 282
- Carcinoma, of thyroid in fish, 237; Gelatinous, of peritoneum, 248; Adeno-, of cerebellum, 356; Complete removal of intestine rectum and colon pelvinum for, 259; Primary, of urethra; retention of urine from obstruction with restoration of function by radium, 421; Amputation of penis for, 422; of œsophagus perforating into right bronchus, 453; Branchiogenic, 541; of colon causing intestinal obstruction, 554
- Carcinoma of breast, Vertebral metastatic, 376; Relation between chronic mastitis and, 451; Acute, 451
- Carcinoma of stomach, Occult-bleeding in ulcer ventriculi and, 364; Multiple acute gastric ulcers after using Percy's cold iron for inoperable, 365; Chylous ascites and chylothorax due to, 454
- Carcinoma of uterus, Heat as method of treatment in inoperable, 60; Roentgen treatment of, 174; treated according to Percy method, 588
- Carcinomata, of nasopharynx, 96; Influence of tethelin and other alcohol-soluble extractives from anterior lobe of pituitary body upon growth of, in rats, 385
- Cardiac, Three juxta-, projectiles extracted by three routes and different procedures, 361
- Caries of spine, Treatment of, by bone-transplantation, 570
- Carotid body, Tumors of, 25
- Carpus, Arrested development of, and tarsus, 263
- Carrel, Treatment of wounds by method of, 397; Results obtained from employing, method in war surgery, 494
- Cartilages, Treatment of unstable, of knee-joint, 567
- Cartilaginous, Repair of losses of frontal substance by means of, transplants, 22; Cranioplasty by, flap, 22; Multiple, exostoses, 39; Cranioplasty, metallic, or by bone-plate, 131; Multiple, exostoses, 472
- Cataract, Suture of cornea in, operation, 193; Newer principles in dealing with uncomplicated, 612
- Cataract: See also Eye, Glaucoma
- Catgut, Toluol as a storing fluid for, 128; Manufacture of, 348
- Cauda equina, Bullet lesion of, 270
- Caudal anaesthesia in genito-urinary surgery, 19
- Causes and treatment of Perthe's disease, 561
- Cautery, Galvano-, operation for lower turbinate, 97; Primary and end-results in inoperable cancer of cervix treated by, method, 173
- Cauterization and fulguration of bladder tumors, 89
- Cava inferiore, Projectile in right lobe of heart after traversing, 453
- Celluloid, Surgical uses of, 231
- Cerebellar, Localization of, tumors, 24; Semicircular apparatus of ear and, localization as diagnostic key to intracranial conditions, 194; localization in light of recent research, 234; Localization of, tumors, 355
- Cerebellar: See also Brain
- Cerebellum, Glioma of, with metastases, 24; Adenocarcinoma of, 356
- Cerebral, abscess due to suppurative tonsillitis, 131; nerve disturbances in exophthalmic goiter, 133; Cranial and cranio-, wounds, 354; Grave accidents of late appearance in cranio-, wounds of war, 354; Pathogenesis and treatment of precocious, persistent, hernia, 540; fat embolism with reference to delirium and coma, 576
- Cerebrospinal fluid, Value of various diagnostic methods for, 169
- Cervix, Lacerated, 69; Primary and end-results in inoperable cancer of, treated by cautery method, 173; Operating during puerperium for cure of old lacerations of, and perineum, 406; Cancer of, uteri with reference to combination method of treatment, 498; Unilateral polypiform œdematous elongation of uterine, 499
- Cervical, ribs, 132; spondylitis of doubtful nature, 155; Sarcoma of nose with metastases in, glands and in brain, 613
- Chancrous, Cure of suppurated, bubo by filiform drainage, 275
- Cheek defects, Plastics of penetrating, due to gunshot injuries, 232
- Chemical, study of tumors, 378; Reactions of blood-vessels to certain, 488; Use of artificial, light in lupus vulgaris, 572
- Chest, Wounds of, in warfare, 27; Radiography of, in children, 166; Gunshot wounds of, 239; Accurate method of localization of foreign bodies in, and their removal, 288; Clinical, cytological, and therapeutical study of wounds of, in ambulance at front, 542

- Childbirth, painless, 179  
 Chloroform, Sudden death in, narcosis, 349; Dangers of, narcosis, 446; Use of, in first stages of labor, 600  
 Cholecystectomy, and cholecystostomy, 37; Retrograde, for chronic cholecystitis, 143; versus cholecystostomy, 556  
 Cholecystectomy: See also Gall-bladder  
 Cholecystitis, Retrograde cholecystectomy for chronic, 143; Postoperative treatment of peptic ulcer and, 251; changes produced by removal of gall-bladder, 468  
 Cholecystostomy, Cholecystectomy and, 37; versus cholecystectomy, 556  
 Cholelithiasis, Uncertainties of understanding anent, 37; Value of determination of cholesterol content of blood in diagnosis of, 556  
 Cholesteatoma, Extensive, following Luc-Caldwell and Killian operation simulating sarcoma, 616  
 Cholesterol content, Value of determination of, of blood in diagnosis of cholelithiasis, 556  
 Choroid, Intra-ocular cancer; sarcoma of, 312  
 Chronic, Phrenicotomy in treatment of some, diseases of lung, 360; abdomen and acute abdomen, 362  
 Chyllothorax, 544; chylous ascites, and lymphosarcoma, 454; Chylous ascites and, due to carcinoma of stomach, 454  
 Cicatrix, Inclusion of radial nerve in, total radial paralysis; liberation of nerve; reappearance of motion and sensation, 49; Repair of breach of trapezius and splenius with, adhering to cervical vertebrae, 374  
 Cicatrization, Process of, of open wounds of brain, 541  
 Ciliary arteries, Traumatic rupture of, 312  
 Circulation, Reversal of, in lower extremity, 163; Clinical relations of gravity, posture, and, 293  
 Cirroid aneurism, 57  
 Citrate solutions, Peritoneal adhesions; prevention with, 31, 32  
 Classification of tumors, 51  
 Clavicle, Old dislocation of, 147  
 Clinical, Pyloric exclusion an experimental and, study, 142; lesions of hypophysis, 449; Basal metabolism in disease and their importance in, medicine, 573  
 Club-foot, Treatment of, 153; Congenital, 269  
 Coagulation, massive and xanthochromic occurring in tuberculosis of cervical spine, 156; Prothrombin and antithrombin factors in, of blood, 161  
 Colic, Pancreatic stone, 38  
 Collargol injections in small doses, 52  
 Colles' fracture, 473  
 Colon, Polyposis of, 143; Complete removal of intestine rectum and, pelvinus for carcinoma, 259; Carcinoma of, causing intestinal obstruction, 554  
 Colonic, Anatomy, physiology and pathology of large intestine with observations on radical operation for, tumors, 553; Experimental, stasis, 462  
 Colotomy, Alternatives to operation of, 463  
 Combination method, Cancer of cervix uteri with especial reference to, of treatment, 498  
 Complications, Aural, of influenza, 94; of acute gonorrhoea in male, 192; Tetanus; a surgical, in present war, 282; Management of, of pregnancy, 598  
 Complicating convalescence, Prevention and treatment of some obscure conditions, after gastro-enterostomy, 229  
 Compression, Sinus thrombosis in, 130; Treatment of naevus flammeus and allied conditions by filtered ultraviolet rays employing, method of application, 491  
 Concretions of spleen, 144  
 Congenital, bilateral elevation of scapula, 46; Large, hydronephrosis in infant, 85; elevation of scapula, 147; Etiology of, absence of parts, 154; cystic kidneys, 186; Gastric volvulus in hour-glass stomach of, malformation, 249; club-foot, 269; anterior curvature of spine, 270; atresia of duodenum treated by operation, 365; stricture of urethra, 421; Necessity for early diagnosis and continuous treatment in, syphilis, 426; stenosis of duodenum in an adult, 456; Complete atresia of ileum, 458; obliteration of bile-ducts; diagnosis and suggestions for treatment, 469  
 Conjunctival flap, Operative treatment of partial staphyloma of cornea and fistula of cornea with, 612  
 Conjunctivitis, Treatment of gonococcic, by autogonococcic serum, 94  
 Conservatism, Technique by which, is made possible in diseases of adnexa, 174  
 Conservative, Plea for, treatment of fractures, 147  
 Consulting, Experiences of, surgeon, 495  
 Contents of ovarian cysts, 502  
 Cord, Anatomico-clinical study of total section of spinal, 47  
 Cornea, Suture of, in cataract operation, 193; Operative treatment of partial staphyloma of, and fistula of cornea with conjunctival flap, 612  
 Corneal, Rosacea keratitis and other forms of marginal keratitis, neuropathic in origin; treatment by perineurotomy, 94  
 Corns, Plasterers', and bunions, 145  
 Cranium, Gunshot wounds of, 232  
 Cranial, Intra-, hæmorrhage due to traumatic rupture of arteria meningea media, 22; Acute mastoiditis with unusual symptoms indicative of intra-, involvement; operation; recovery, 94; Intra-, arocele, 130; Wounds in war surgery, 353; and craniocerebral wounds, 354; Pathologic anatomy of immediate lesions in penetrating, fractures due to projectiles, 538; Wounds by war projectiles at front, 538; Treatment of, wounds at front, 539; Treatment of, wounds by war projectiles, 539  
 Craniocerebral, Grave accidents of late appearance in, wounds of war, 354; Operations for, wounds of modern warfare, 448  
 Craniopharyngeal duct tumors, 233  
 Cranioplasty, by cartilaginous flap, 22; Metallic, cartilaginous or by bone-plate, 131  
 Criminal abortion, Duties of medical practitioners in, 68  
 Crises, Visceral, in angioneurotic oedema, 245  
 Crural hernias, Treatment of large, by pediculated adipose graft, 364  
 Crying, Intra-uterine, 508  
 Cultures, Tissue, in investigation of cancer, 273  
 Curvature, Congenital anterior, of spine, 270  
 Curved lines of suction, 604  
 Cysts, Infection of ovarian dermoid, with typhoid bacillus, 74; Infra-epiglottal, 195; Congenital and fistulæ of neck, 350; Contents of ovarian, 502; Labor obstructed by ovarian, 599  
 Cystectomy, Total, one and a half years after operation, 421  
 Cystic, dilatation of vermiform appendix, 143; hygroma in infant, 185; Congenital, kidneys, 186  
 Cystocele, Etiology of uterine prolapse and, 500  
 Cystography, Use of oxygen in, with preliminary report on use of oxygen in pyelography, 511  
 Cytological analysis of shock, 578  
 DACRYOCYSTITIS, Digital compression of lachrymal sac in, of newborn, 312  
 Davis operation, Cesarean section by modified, 303  
 Death, Sudden, in chloroform narcosis, 349; Cesarean section performed with a pocket knife after, of mother resulting in normal and living child, 505  
 Deaths attributable to intranasal operations and other instrumentation, 97



- Decidua, Histochemical research regarding the function of the, 306
- Deformities, of jaws resulting from operation or injury, 21; due to infantile paralysis; operative treatment, 45; of feet, 46; Operation for correction of, due to obstetrical paralysis, 49; Subastragalar arthrodesis in lateral, of paralytic feet, 153; Influence of os calcis on production and correction of valgus, of foot, 265; External genital, due to retardation in morphologic evolution, 301; Operative treatment for disabilities and, following anterior poliomyelitis, 477; Subastragalar arthrodesis in lateral, of paralytic feet, 478; Soldier's foot and treatment of common, of foot, 479
- Degeneration, Fibroid, of appendix, 256
- Delayed tetanus, 58
- Delbet, Study of pus in war surgery, by pyoculture method of, 493
- Delirium and coma, Cerebral fat embolism with reference to, 576
- Delivery by natural passages following caesarean section, 178
- Dental, Roentgen ray in, practice, 431
- Dermatolysis and molluscum fibrosum with congenital morbus cordis and kyphosis, 275
- Dermoid, Infection of ovarian cyst with typhoid bacillus, 74
- Detachment, Hemorrhage associated with partial and complete, of normally implanted placenta, 304
- Devascularized, Treatment of, intestine, 367
- Dextrose, Disappearance of, from blood after intravenous injection, 277
- Diabetes insipidus, Hypophyseal disorder in mammary cancer and its relation to, 135
- Diabetes and prostatectomy, 424
- Diagnosis, of appendicitis in childhood, 143; Pathological, of diseases of appendix, 459; Appendicitis; its radio-, 552; Practical methods in, 169; and treatment of brain injuries in adults, 355; Sympathetic system in, of abdominal diseases, 400; of cancer of stomach, 551; in gynecology, 404; Early, of cancer of breast, 450; Early, of intussusception in children under three years of age, 457; Duodenal tube as factor in, and treatment of gall-bladder disease, 466; Congenital obliteration of bile-ducts, and suggestions for treatment, 469; Corroborative, of mastoiditis by means of X-ray, 515; and treatment of trifacial neuralgia, 537; Sarcoma of scapula; histological, made by study of blood aspirated from pulsating portion of tumor, 542; of cancer of rectum, 554; of internal secretory disorders, 573; of aneurisms of descending aorta, 576; of pelvic troubles, 593; Urinary, of pregnancy, 601; of certain surgical lesions of kidneys, 606; of renal and uterine calculi, 608; Pyelo-ureterography as aid in, of obscure surgical conditions of kidney and ureter, 608
- Diagnostic, Value of various, methods for cerebrospinal fluid, 169; Study plan for, team acting as laboratory for profession, 399; Morphine as an early, element in certain forms of acute appendicitis, 461; Intraperitoneal inoculation of animals its, value in orthopedic surgery, 477
- Diaphragm, Eventration of, with report of right-sided eventration, 32
- Diaphysary, Treatment of, gunshot injuries in ambulance at the front, 561
- Differential diagnosis, Value of pain, jaundice, and tumor mass in, of diseases of right upper quadrant of abdomen, 470
- Digestion, Management of surgical disorders of, 255
- Digestive tube, Spontaneous rupture of, 550
- Dilatation, Cystic, of vermiform appendix, 143; Adjustment of intra-uterine stem versus, to overcome stenosis of cervical canal, 173
- Dilatation aneurisms, Diagnosis, symptomatology, and therapy of, of descending thoracic aorta, 280
- Diphtheria, Prolonged use of tubes following, 357
- Diphtheria carriers, Removal of tonsils and adenoids in, 98
- Disabilities, Causes of prolonged, from fractures, 264; Surgical, of troops in training, 398; Operative treatment for, and deformities following anterior poliomyelitis, 477
- Diseases, Treatment of, of stomach, 34
- Disinfection, Results obtained by early and systematic of war wounds, 583
- Dislocation, of first cervical vertebra produced by manipulation, 48; Old, of clavicle, 147; Fracture of, astragalus, 372; Posterior, of lower humeral epiphysis as birth injury, 604
- Displacement, Operation of retro-, of uterus, 71, 402; Operation for posterior, of uterus, 296; Treatment of backward, of uterus, 500
- Disturbances, Thymic, in adult, 135
- Diuretic, Hexamethylenamine as urate solvent and, and its effect on reaction of urine, 92
- Dorsalis pedis artery, Aneurism of, 280
- Double uterus in its relation to diagnosis and treatment, 71
- Drainage, Cure of suppurated chancrous hubo by filiform, 275; Treatment of septic wounds with, 292; Vesical, historical review and presentation of new apparatus, 420; Responsibility for loss of, tube in body of child, 497; for pus conditions in pelvis during pregnancy, 601
- Dressings, Wound, 127; of wounds based on 943 observations, 583
- Drop-wrist, Splint for, 475
- Drum membrane, New method of opening, in purulent otitis media by means of trephine, 613
- Ductless glands and their relation to treatment of functional gynecological diseases, 592
- Duodenum, Anatomical and physiological subdivisions of, with pathogenesis of ulcer, 142; Roentgenoscopic examination of stomach and, 167; Congenital atresia of, treated by operation, 365; Chronic ulcer of, and its gastric repercussion, 366; Congenital stenosis of the, in an adult, 456; Perforated ulcers of stomach and, 550
- Duodenal ulcers, Perforating pyloric and, 252; Chronic gastric and, 253; with special reference to its X-ray diagnosis, 254; Surgical treatment of gastric and, 254; Roentgenologic diagnosis of, 366
- Duodenal, use of polygram in gastro-, diagnosis, 390; tube as factor in diagnosis and treatment of gall-bladder disease, 466
- Duodenopyloric, Ulcer of, fornix, 35
- Dura, Large endothelioma of, compressing both frontal lobes, 449
- Dysmenorrhoea, Results in X-ray treatment of menorrhagia, and uterine myoma, 71; with antelexion and retrocession, 590
- Dysthyroidism, Blood-pressure in, 134
- Dystocia, by fixation of shoulders after birth of head, 178; Foetal, and caesarean section, 410
- EARS, Infections of, nose, and throat as primary foci for secondary infections, 612
- Eberthian strumitis, 541
- Eclampsia, causes, nature, and treatment, 78; Treatment of, 407; Frequency of puerperal, 596; Treatment of, 596
- Economics, Surgeon's responsibility to, of the hospital, 585



- Ectopia, Makka's operation for, of bladder, 89  
 Ectopic, Recognition and treatment of, gestation, 303;  
     Rare form of single, kidney, 606  
 Elastometer, (Edema by means of, 60  
 Elbow, Resections of, in war surgery; functional end-  
     results, 374; Treatment of injuries in vicinity of,  
     joint, 374  
 Electrocautery, Epithelioma of posterior pharyngeal wall  
     cured with, 618  
 Electromagnet, Extraction of piece of grenade from pleural  
     cavity by, 359  
 Elevation, Congenital bilateral, of scapula, 46; Congenital,  
     of scapula, 147  
 Elongation, Unilateral polypiform oedematous, of uterine  
     cervix, 499  
 Embolism, Venous thrombosis and, cause, significance,  
     and consequence, 54; in arteries, 575; Cerebral fat,  
     with reference to delirium and coma, 576  
 Empyema, Treatment of chronic non-tuberculous, 240;  
     Recent progress in operative treatment of, of thorax,  
     544; Bismuth paste in chronic suppurative sinuses  
     and, incorrect technique as cause of failure in its  
     application, 545  
 End-to-end suture of bile-ducts, 371  
 Endamebiasis, Tonsillar, and thyroid disturbance, 26  
 Endocrine glands, Pseudohermaphroditism, with abnormal  
     function of, 175; Alterations of the, especially the  
     thymus and of blood following vagotomy, 490  
 Endogastrectomy, Total, 142  
 Endometrium, Relation of, and ovary to hæmorrhage from  
     myomatous uteri, 589  
 Endoscopic surgery of œsophagus and respiratory tract,  
     617  
 Endothelioma, Large, of dura compressing both frontal  
     lobes, 449; of right bronchus removed by peroral  
     bronchoscopy, 547  
 End-results, of entero-biliary anastomosis, 37; Fracture  
     of neck of femur; treatment and, of 55 cases, 41; in  
     umbilical hernia operations, 249; of resection of ovaries  
     for microcystic disease, 301; Resections of elbow in  
     war surgery; functional, 374; in cases operated for  
     salpingitis, 503; of pleuropulmonary wounds by war  
     projectiles, 548; of nephrectomy, 607  
 Enteric, intussusception, 256  
 Entero-biliary, End-results of, anastomosis, 37  
 Enucleation, Technique of, thyroidectomy, 238  
 Epididymis, Tuberculosis of seminal vesical and, 91  
 Epididymitis, Paratyphoid orchis, 422  
 Epidural injections, Obstetrical analgesia by, of novocaine,  
     411  
 Epiglottal, Infra, cysts, 195  
 Epilepsy, Acute angulation and flexure of sigmoid; a  
     causative factor, in 463; Etiology of pelvic disease in,  
     592  
 Epinephrin, Pharmacology of ureter; action of, ergotoxin,  
     and nicotine, 165; Liberation of, from adrenal glands  
     by stimulation of splanchnic nerves and massage,  
     284; Effect of, on medullary centers, 285  
 Epiphysitis, Retarded ossification as etiologic factor in  
     traumatic arthritis and, 40  
 Epiploon, Extraction from abdomen of bullet encysted in,  
     362; Surgery of posterior wall of stomach; method of  
     choice in approaching rear cavity of, 365; and peri-  
     colitis, 388  
 Epithelium, Effects of cancer tissue and normal, on  
     vitality of protozoa, 273  
 Epithelioma, Treatment of, of lower lip, 389  
 Ergotoxin and nicotine, Pharmacology of ureter; action  
     of epinephrin, 165  
 Essential hæmorrhage of uterus, 499  
 Ether, Use of warmed, vapor for anæsthesia, 129; Anti-  
     septic action of, in peritoneal infections, 248; Organic  
     depression of nerve-cell produced by prolonged,  
     anæsthesia, 578; Relation of, pneumonia to pelvic  
     and abdominal surgery, 593  
 Ethmoidal region, Malignant hypernephroma of, 428  
 Etiology, and prophylaxis of cancer, 50; of congenital  
     absence of parts, 154; of pelvic disease in epilepsy,  
     592  
 Eusol, Application of, 18  
 Eventration of diaphragm, with report of right-sided  
     eventration, 32  
 Excision, Partial, of thyroid cartilage as an alternative  
     to thyrotomy in malignant disease of vocal cord, 315;  
     versus gastro-enterostomy in treatment of gastric  
     ulcer, 551  
 Exophthalmos, Attempts to produce, experimentally,  
     165; Pulsating, 425  
 Exophthalmic goiter, Cerebral nerve disturbances in, 133;  
     Metabolism in, 485  
 Exostoses, Multiple cartilaginous, 39; Subungual, 40;  
     Multiple cartilaginous, 472  
 Experimental, surgery of mediastinum, excluding the  
     heart, 59; Pathological aspects of some problems of,  
     cancer, research, 60; grounds for treatment of lung  
     tuberculosis by X-rays, 61; Bacteriological and,  
     research on gas gangrene, 64; Pyloric exclusion an,  
     and clinical study, 142; alterations produced by  
     micrococcus melitensis, 165; Attempts to produce,  
     exophthalmos, 165; Serum changes and cause of  
     death in, pancreatitis, 262; researches on regenera-  
     tion and neof ormation of lymph-glands, 284; Bac-  
     teriology and, production of ovaritis, 300; researches  
     on mechanism of menstruation, 302; cloudy swelling  
     of kidney in rabbit, 308; Clinical and, study of  
     postoperative ventral hernia, 347; study of use of  
     sodium citrate in transfusion of blood by direct and  
     indirect methods, 379; study of additive and antago-  
     nistic actions of sodium oxalate and salts of mag-  
     nesium and calcium in the rabbit, 387; Tubercular  
     bacillæmia, 388; colonic stasis, 462; hypercholes-  
     terolemia, 485; Bacteriological and, studies on gastric  
     ulcer, 486; renal sporotrichosis, 487  
 Expert evidence as to treatment; patients' duty to  
     minimize damage, 294  
 Exploration, Tonsilloscope and, of interior of tonsils in  
     situ, 617  
 Extension, Treatment of fractures by suspension and, 474;  
     splint for fractures of humerus, 564  
 Extraction, New method of bullet, 228; of bullets from  
     bladder by natural route, 419  
 Extra-uterine, Treatment of, pregnancy in advanced  
     periods, 407  
 Extremities, Conservative treatment of gangrene of, due  
     to thrombo-angiitis obliterans, 53  
 Eye, Injuries of deep membranes of, in war with integrity  
     of ball, 193; Liberation of epinephrin from adrenal  
     glands by stimulation of splanchnic nerves and by  
     massage, studied by means of denervated reaction,  
     284; X-ray localization of foreign bodies in, by Sweet  
     method, 611  
 FACE, War injuries of jaw and, 350; Very extensive  
     shell wound of, reduction of ensuing deformity by  
     extirpation of the cicatrix, 350  
 Fæcal fistula, Prevention of, in suppurative appendicitis,  
     368  
 Fæcal, Unusual, and genito-urinary cases treated by bis-  
     muth paste, 514  
 Faucial tonsil, Physicomechanical function of, 430



- Feet, Deformities of, 46; Subastragalar arthrodesis in lateral deformity of paralytic, 153; Paralytic, 268; Subastragalar arthrodesis in lateral deformities of paralytic, 478; and their care, 569
- Femur, Fracture of neck of; treatment and end-results of 55 cases, 41; Treatment of oblique fracture of, 146; Fracture of, 564; Intracapsular fracture of, 565
- Femoral aneurism, Treatment of, 162
- Ferments, Blood, in pregnancy, 506
- Fibroid, Radium treatment of uterine, 70; Complicating pregnancy, 305; Degeneration of appendix, 256
- Fibroma, Technique of new procedure for subtotal abdominal hysterectomy in uterine, or inflammation of adnexæ, 296; Symmetrical pressure, 472
- Fibrous tissue, Origin and structure of, formed in wound healing, 487
- Field hospitals, Secondary union of war wounds by first intention in the, 494
- Filter, for deep roentgen therapy, 61
- Fissure in ano, Observation on, 466
- Fistula, Vesical, due to permanent foreign body in bladder, 189; Congenital cysts and, of the neck, 350; Anorectal, 259; Prevention of faecal, in suppurative appendicitis, 368; Menstrual, of abdomen, 404; Operative treatment of partial staphyloma of cornea and, of cornea with conjunctival flap, 611; Orbital and peri-orbital, 425
- Fixation, Artificial periosteum for, of shaft fractures, 41; Dystocia by, of shoulders after birth of head, 178; New method of fracture, 264; Method of treating gunshot fractures by external, apparatus, 264
- Flail-foot, Stabilizing the, in infantile paralysis, 479
- Flapless amputation, 268
- Flat-foot, Superstition of, 46; Autogenous bone-graft pin in treatment of painful and paralytic valgus, 266; Methods used in, at Yale, 479
- Fluoroscope, Use of, to avoid leaving gauze pads and sponges in the abdomen, 127
- Focal infections; results of overcoming same, 517
- Fœtus, Teratoid tumor of anterior region of neck in human, at term, 541
- Fœtal, Appearance of pressor substance in, hypophysis, 388; Dystocia and cesarean section, 410
- Foot, Superstition of flat-, 46; Methods used in flat-, at Yale, 479; Congenital club-, 269; Painful anterior arch of, operation for relief by raising the arch, 269; Partial amputations of, for gunshot wounds of war, 375; Golfer's, 376; Stabilizing the flail-, in infantile paralysis, 479; Soldier's foot and treatment of common deformities of, 479
- Forceps, High, operation, 80
- Foreign bodies, Exact localization of, by means of roentgen rays, 61; Vesical fistula due to permanent, in bladder, 189; Removal of intracranial, under X-rays, 232; Removal of, from œsophagus and bronchi; new instruments, 242; Accurate method of localization of, in chest and their removal, 288; Removal of bullets and metallic, 289; in respiratory tract, 360; Ablation of, from heart followed by recovery, 361; in bladder resulting from gunshot wounds, 420; Movements of, in brain, 448; Anatomical position of localized, 492; Bronchiectasis and bronchiectatic symptoms due to, 547; X-ray localization of, in eye by Sweet method, 611
- Fractures, of neck of scapula, 41; Device for intramedullary, splinting, 43; splints, 232; War, 145; records; effort towards standardization, 146; Bony union in intracapsular, of hip-joint, 146; of lumbar vertebrae and transverse processes, 155; of odontoid process of axis, 156; Diagnosis of, by physical examination versus skiagraphy, 263; problem, 263; Causes of prolonged disability from, 264; Uses and limitations of stereoscopic radiograms in diagnosis of injury to bone after-treatment of, 287; Pneumococcal and meningococcal meningitis after, of base of skull, 353; Results of, of os calcis, 372; dislocation of astragalus, 372; of tuberosities of tibia, 372; of larynx, 431; Bluesclerotics; their relation to multiple, in childhood, 472; in children, 564; Malunited and ununited, 473; Isolated, of head of radius, 473; Colles', 473; Sprains and sprain-, of the wrist-joint, 564; Rupture of bladder associated with, of pelvis, 512; Pathologic anatomy of the immediate lesions in penetrating cranial, due to projectiles, 538; of arteries, 575
- Fractures of femur, 564; Treatment and end-results in, 41; Treatment of oblique, 146; Intracapsular, 565
- Fractures, Treatment of, 474; Maxillary, 21; Artificial periosteum for fixation of shaft, 41; Plea for conservative, 147; Operative, in war, 147; Transplantation of bone in ununited, of shaft of humerus, 264; Extension splint for, of humerus, 564; Transplantation of bone in ununited, of shaft of humerus, 568; New method of, fixation, 264; Gunshot, by external fixation apparatus, 264; Surgical procedures in gunshot, of mandible, 350; Gunshot, 565; Primary resection in treatment of articular gunshot wounds with, 566; Gunshot, 373; of thigh in war surgery, 371; Immediate reduction of, 373; Open operation for, 373; by suspension and extension, 474; Choice of method in treatment of, 474; Operative treatment of simple, 565; Autogenous bone-splints in, and tuberculous spines, 568
- Frontal lobes, Large endothelioma of dura compressing both, 449
- Frozen limbs and their treatment in present war, 561
- Fulguration, Cauterization and, of bladder tumors, 89
- Function, of thyroid parathyroid apparatus, 134; of kidney when deprived of its nerves, 188; Histochemical research regarding the, of the decidua, 306
- Functional, status of amputation stumps in war, 148; Complete nerve sections treated by suture with, restoration in injured nerves, 273; Ductless glands and their relation to treatment of, gynecological diseases, 592
- Furunculosis, Vaccine therapy and other treatment in acne vulgaris and, 481
- GALL-BLADDER, Time for operating in acute appendicitis and, disease, 258; Operation for removing the, 261; Infolding and peritonealizing stitch with application of the same to broad ligament and, 346; Duodenal tube as factor in diagnosis and treatment of, disease, 466; Cholecystitis; changes produced by removal of gall-bladder, 468; Surgery of, and biliary passages, 556
- Gall-stone, diagnosis by roentgen ray, 262; Negative and positive roentgen diagnosis of, 370; Recurrence of symptoms after operation for, disease, 467
- Galvanocautery operation for lower turbinate, 97
- Gangrene, Conservative treatment of, of extremities due to thrombo-angiitis obliterans, 53; Bacteriological and experimental research on gas, 64; Pulmonary, of otitic origin, 135; Pathology of gas, 383; Presenile-, thrombo-angiitis obliterans, 483; Gaseous, in war surgery, 493
- Gangrenous, Bacteria of, wounds, 283
- Gas burns, 384
- Gas gangrene, Bacteriological and experimental research on, 64; in present war, 289; Pathology of, 383; in war surgery, 493
- Gas-oxygen, Apparatus for administration of, 18



- Gastrectomy, Total endo, 142
- Gastric, Roentgen-ray diagnosis of, lesions, 33; Roentgen studies after, and intestinal operations, 34; Ionic concentration of, contents in some stomach diseases, 249; Time relations of, pains with reference to gastric adhesions, 249; Volvulus in hour-glass stomach of congenital malformation, 249; Chronic ulcer of duodenum and its, repercussion, 366; Fractional methods of examination of, contents, 549; Advantages of separate suture of mucous membrane in, surgery, 551
- Gastric ulcer, following removal of adrenals, 33; Etiologic relationship existing between, and gastric cancer, 140; Trophic element in origin of, 140; Treatment of, 141; Cause of, 250; Traumatic, 251; and duodenal ulcer, chronic, 253; Multiple acute, after using Percy's cold iron for inoperable carcinoma, 365; Bacteriological and experimental studies on, 486; Surgical treatment of, 254
- Gastroduodenal, Use of polygram in, diagnosis, 390
- Gastro-enterostomy, Prevention and treatment of some obscure conditions complicating convalescence after, 229; Excision versus, in treatment of gastric ulcer, 551
- Gastro-intestinal, Roentgenographic findings in, tract, 33; Infections of mouth, nose, and throat, as primary foci for infections in, 139; examinations by roentgen ray, 288; Roentgen diagnosis of obscure lesions of the tract, 391
- Gaucher's, Lipin content of, disease in infant, 39
- Gauze, Non-adhering surgical, 17; Use of fluoroscope to avoid leaving, pads and sponges in the abdomen, 127; Sheet rubber superior to, sponges in abdominal operations, 535
- Genital, Syphilis of internal, organs in female, 74; Diagnosis and prognosis of uro, tuberculosis, 92; External, deformity due to retardation in morphologic evolution 301; Treatment of, prolapse, 405
- Genito-urinary, Caudal anaesthesia in, surgery, 19; symptoms arising from anal, rectal, and colonic diseases, 93; Diagnosis of, tuberculosis, 192; Unusual faecal and, cases treated by bismuth paste, 514
- Gestation, Recognition and treatment of ectopic, 303; complicated by appendicitis, 597
- Glands, Physiology of parathyroid, 26; Non-surgical treatment of tuberculous, 133; Pineal, 284; Anatomy and surgery of thyroid, 449
- Glaucoma, Sclerocorneal trephining in, 515
- Glioma of cerebellum with metastases, 24
- Goiter, Cerebral nerve disturbances in exophthalmic, 133; Metabolism in exophthalmic, 485
- Golfer's foot, 376
- Gonococcic, Treatment of, conjunctivitis by autogonococcic serum, 94
- Gonorrhoeal, Surgical treatment of, tube infection with a quarantine pack, 77; Treatment of, ophthalmia, 81; Complications of acute, in the male, 192; Infection of urethral glands, 190
- Graft, Pott's disease treated by bone-, 44; Treatment of large crural hernia by pediculated adipose, 364; Osteoperiostic, taken from tibia to serve in reconstruction of bone or in repair of loss of osseous substance, 476; Transplantation of bone and some uses of bone-, 568; Bone-, for spinal conditions, 47
- Graves' disease, Scleroderma associated with, and later myxoedema, conspicuously benefited by implantation of human thyroid into bone-marrow, 238
- Growths, Pituitary feeding upon, and sexual development, 131; Malignant transformation of benign, 465
- Gunshot fractures, Method of treating, by external fixation apparatus, 264; Surgical procedures in, of mandible, 350; Treatment of, 373, 565
- Gunshot injuries, of peripheral nerves; syndrome of compression, 156; Plastics of penetrating cheek defects due to, 232; Ankylosis following, of joints, 270; Injuries of spinal cord with, of cord at fourth cervical vertebra and successful removal of projectile, 377; Treatment of diaphysary, in ambulance at the front, 561
- Gunshot wounds, of head, 20; of thorax, 28; Abdominal, 30; of soft parts, 63; Treatment of, 65; in upper limbs, 167; retention, 167; of cranium, 232; Radiography in, of skull, 232; of chest, 239; Symptoms and complications of, of solid abdominal viscera, 246; of spine, 270; and injuries of spinal cord, 271; Treatment of, of spine, 271; arteriovenous aneurism in which the sac was situated on side opposite the vein, 280; Auscultation in diagnosis of vascular injuries accompanying, 281; Partial amputations of foot for, of war, 375; Foreign bodies in bladder resulting from, 420; Treatment of, in bladder, 420; Treatment of, of testicle, 422; of abdomen in pregnant women, 507; Articular, 563; Primary resection in treatment of articular, with fracture, 566
- Gynecology, Psychiatry and, 302; Diagnosis in, 404
- Gynecological, Ductless glands and their relation to treatment of functional, diseases, 592
- HÆMATOLOGY in obstetrics, 603
- Hæmatoma, Suppurative, of iliac fossa, 277
- Hæmaturia, Unilateral, 86; Unilateral, associated with fibrosis and multiple microscopic calculi of renal papillæ, 510
- Hæmolysis, Relation of, in transfusion of babies with mothers as donors, 56
- Hæmophilia, Blood and blood-vessels in, and other hæmorrhagic diseases, 53
- Hæmorrhage, Pillar-compression forceps for controlling, following tonsillectomy, 20; Intracranial, due to traumatic rupture of arteria meningeal media, 22; Secondary, in military surgery, 52; Lacing the lingual artery for secondary, of the tongue, 162; Associated with partial and complete detachment of normally implanted placenta, 304; Significance of, in operations on nose and throat, 314; Control of, in extensive operations on nose and jaws, 427; Essential, of uterus, 499; Secondary tonsillar hæmorrhage, 516; Present conditions in treatment of, due to low insertion of the placenta, 599; Blood-transfusion in, of newborn, 604
- Hæmorrhagic, Blood and blood-vessels in hæmophilia and other, diseases, 53; New, operation; snare and bullet, 261; Blood-transfusion in treatment of severe post-hæmorrhagic anæmia and, diseases, 279; Acute, pancreatitis, 557
- Hæmorrhoids, Treatment of, by injection, 260; Bloodless operation for, and prolapsus ani, 261; Treatment of, by new method, 466
- Hallux, rigidus, 269; valgus, 376
- Head, Gunshot wounds of, 20; Immediate treatment of, injuries from projectiles, 129; Treatment of, injuries in casualty clearing station, 477
- Healing, Origin and structure of fibrous tissue formed in wound, 487
- Heart, Ablation of foreign body from, followed by recovery, 361; Projectile penetrating and lodging in, 361; Projectile in right lobe of, after traversing cava inferior, 453; Management of pregnancy and labor complicated by, -disease, 598
- Heat, as method of treatment in inoperable uterine carcinoma, 69; Use of, in control of inoperable cancer, 498
- Heliotherapy, General, in treatment of bone and joint affections, 263



- Hemiplegics, Orthopedic treatment in, 569  
 Hepatoptosis, Partial, due to interposition, 370  
 Hermaphroditism, Pseudo, with abnormal function of endocrine glands, 175  
 Hernia, Retro-inguinal, 248; End-results in umbilical, operations, 249; Clinical and experimental study of postoperative ventral, 347; Treatment of large crural, by pediculated adipose graft, 364; in relation to intestinal stasis, 455; of urinary bladder, 512; Pathogenesis and treatment of precocious, persistent, cerebral, 540  
 Heterogenous bone-peg, 266  
 Hexamethylenamine as urate solvent and diuretic; effect on reaction of urine, 92  
 Hexamine as urinary antiseptic, 189  
 High explosives, Effects of, upon central nervous system, 63  
 High forceps, operation, 80; Cæsarean section, pituitary extract, 303  
 Hip-joint, Bony union in intracapsular fractures of, 166; Osteomyelitis involving the, 473  
 Hirtz compass, Operative technique of extraction of projectiles under guidance of, 170  
 Hospital, Post-, care of surgical patient, 59; Proposed equipment for, corps, 293; Organization and problems of war, 293; Surgeon's responsibility to economics of, 585  
 Humerus, Resection of, for fistulous osteomyelitis, 44; Transplantation of bone in ununited fractures of shaft of, 264; Extension splint for fractures of, 564; Transplantation of bone in ununited fractures of shaft of, 568  
 Humeral epiphysis, Posterior dislocation of lower, as birth injury, 604  
 Hydatidiform mole, 302  
 Hydrocele, Vaginal, operated upon by inguinal route, 191  
 Hydrocephalus, Pathological bases of, to its surgical alleviation, 23; Differentiation and treatment of, 23; Anatomical cause of frequency of, in childhood, 448  
 Hydronephrosis, Large congenital, in an infant, 85; Multiple ureters with, 189  
 Hydrops tubæ profluens, 301  
 Hygroma, Cystic, in infant, 185  
 Hypercholesterolemia, Experimental, 485  
 Hypernephroma, Origin of, of kidney, 416; Malignant, of ethmoidal region, 428  
 Hyperthyroidism, Quinine and urea injections in, 236  
 Hypochlorous acid, Surgical and antiseptic values of, 17  
 Hypodermatic treatment of joint injuries, 374  
 Hypophysary, Cachexia of, origin, 378  
 Hypophysis, Appearance of pressor substance in foetal, 388; Clinical considerations of lesions of, 449  
 Hypophyseal disorder in mammary cancer, relation to diabetes insipidus, 135  
 Hypothalamic, Tumors of, region of middle brain, 355  
 Hysterectomy, Technique of new procedure for subtotal abdominal, in uterine fibroma or inflammation of adnexæ, 296; Vaginal, 501; Vaginal, for procidentia, 501
- I**LEUM, Complete congenital atresia of, 458  
 Ileus, Post-operative, 367; Absence of muscular tone an etiological factor in postoperative, 459  
 Iliac fossa, Suppurative hæmatoma of, 277  
 Immune-reactions against tumor-growth in animals with spontaneous tumors, 158  
 Immunity, Continuous transfusion in production of, 161; Tumor, 274; conferred by transfer of immune and mixed immune and sensitized serums, 574  
 Implantation, Scleroderma associated with Graves' disease, and later myxœdema, conspicuously benefited by, of human thyroid into bone-marrow, 238; Sex-gland, 424  
 Inanition, Effects of tethelin; recovery of weight lost during, and in healing of wounds, 286  
 Industrial accident, Ocular tuberculosis secondary to, 312  
 Infant, Operative treatment of pyloric obstruction in, 34; Injuries to, produced at birth, 82; Cystic hygroma in, 185  
 Infantile paralysis, Deformities due to, operative treatment, 45; Tendon-transplantation in, 45; Non-operative treatment of, 46; Result of astraglectomy in, 153; Treatment of, 478; Stabilizing the flail-foot in, 479  
 Infection, Chronic general, with bacillus pyocyaneus, 58; Non-surgical, of kidneys and ureters, 84; of mouth, nose, and throat as primary foci for infections in gastro-intestinal tract, 139; of mouth, ear, nose, and throat as primary foci for secondary infections, 196; Roentgenologic examination in elimination of mouth as source of, in systemic disease, 315; Oral sepsis as focus of, 315; Torula, in man, 400; Puerperal, 413; Regeneration of long bones following, 472; Focal results of overcoming same, 517  
 Infected, Treatment of, wounds by physiological methods, 584; Treatment of, suppurating war wounds, 584  
 Infiltration, Method of facilitating, anæsthesia, 349  
 Inflammations, Treatment of non-tuberculous, of seminal duct, 91  
 Inflammatory, Diagnosis and treatment of, affections of the nasal accessory sinuses, 96  
 Influenza, Aural complications of, 94  
 Influenzal, Acute mastoiditis with, meningitis; treatment by operation on mastoid and anti-influenzal serum, 94  
 Infra-epiglottal cysts, 195  
 Infusion, Intravenous continuous, at front, 379  
 Inguinal, hernia from medicolegal aspect, 171; Incision for intrascrotal affections, 191; Vaginal hydrocele operated upon by, route, 191; Retro-, hernias, 248  
 Injections, Collargol, in small doses, 52; Quinine and urea, in hyperthyroidism, 236; Treatment of hæmorrhoids by, 260  
 Injuries, Deformities of jaws resulting from operation or, 21; War, of jaw and face, 130, 350; Immediate treatment of head, from projectiles, 129; Treatment of head, in casualty clearing station, 447; of the large blood-vessels in war, 57; to infant produced at birth, 82; War, of urogenital system, 85; of lower spine, 155; of deep membranes of eye in war with integrity of ball, 193; Immediate and after-treatment of railway, 238; Diagnosis and treatment of brain, in adults, 355; Hypodermatic treatment of joint, 374; Treatment of, in vicinity of elbow-joint, 374; Experience with vascular, 381; Manual expression of bladder in spinal, 421; Technical features of laminectomy for spinal disease and, based on 150 spinal operations, 569; Ano-rectal, 465; War, 493; of lower back, 569; of bladder and urethra in war, 609; to undiseased parts in performance of operations, 496  
 Inoculation, Intraperitoneal, of animals, its diagnostic value in orthopedic surgery, 154  
 Internal secretions, Histologic physiopathologic research on, of pancreas in pregnancy, 184; Myopathy related to disorders of, 481  
 Interposition, Partial hepatoptosis due to, 370  
 Intestine, Strangulated fallopian tube, ovary and, in an infant, 74; Treatment of devascularized, 367; Paralysis of, after resection for gunshot injuries, 551; Process of repair in wounds of small, 552; Anatomy, physiology, and pathology of large, 553  
 Intestinal, Roentgenographic findings in gastro-, tract, 33; Roentgen studies after gastric and, operations, 34; adhesions, 255; stasis, 256; function in pancreopathic

- conditions, 386; Roentgen diagnosis of obscure lesions of the gastro-, tract, 391; Hernia in relation to, stasis, 455; obstructions; non-coagulable nitrogen of blood, 456; High, stasis, 458; Carcinoma of colon causing, obstruction, 554
- Intracranial, aerocele, 130; Semicircular apparatus of ear and cerebellar localization as diagnostic key to, conditions, 194; Removal of, foreign body under X-rays, 232
- Intraperitoneal inoculation of animals, its diagnostic value in orthopedic surgery, 154, 477
- Intratracheal injection, Absorption of adrenalin after, 489
- Intra-uterine, Adjustment of, stem versus dilatation to overcome stenosis of cervical canal, 173; crying, 508
- Intravenous, Injections of lactose without reaction, 87; Disappearance of dextrose from blood after, injection, 277; continuous infusion at front, 379; injection of magnesium sulphate for anaesthesia in animals, 386
- Intussusception, Enteric, 256; Early diagnosis of, in children under three years of age, 457
- Iodine in tetanus, 282
- Ionization, Cancer subjected to surgical, 158
- Ionic concentration of gastric contents in some stomach diseases, 249
- Irrigation, Continuous, of wounds in field, 347
- Ischiorectal abscess from fish-bone, 259
- Ischiopubic disconnection, Total, of deep perineal fascia, 421
- J**AWS, Deformities of, resulting from operation or injury, 21; War injuries of, and face, 130; War injuries of, and face, 350; Control of hæmorrhage in extensive operations on nose and, 427
- Jejunum, Ulcer of, 35
- Joints, Tuberculosis of, Changed character of later lesions occurring in healed, 145; Necessity of operation in, 475; Treatment of abscesses in, and bones, 475; Value of roentgenology in treatment of bone and, 581
- Joints, Treatment of infected, in war, 42; Overlapping, as substitute for cuneiform osteotomy, 43; Loose bodies in knee-, 263; Treatment of unstable cartilages of knee-, 567; Heliotherapy in treatment of bone and, affections, 265; Arthroplasty of interphalangeal, 265; Ankylosis following gunshot injuries of, 270; Hypodermatic treatment of, injuries, 374; Treatment of injuries in vicinity of elbow-, 374; Osteomyelitis involving the hip-, 473
- K**ERATITIS, Rosacea, and other forms of marginal keratitis, 94
- Kidney, Non-surgical infection of, and ureters, 84; Urine stasis in etiology of pyogenic, infections, 84; tipping by grenade splinter, 85; Intravenous injections of lactose without reactions; Sclayer's, test, 87; Inhibition of toxicity of anaesthetics for nephropathic, 128; Congenital cystic, 186; Function of, when deprived of its nerves, 188; Surgery in, conditions, 188; Experimental cloudy swelling of, in rabbit, 308; Malignant tumor of right, in child, 416; Origin of hypernephroma of, 416; Abscess of, cortex and its relation to paranephritic suppuration, 416; Surgical replacement of prolapsed, 510; Rare form of single ectopic, 606; Diagnosis of certain surgical lesions of, 606; Sarcoma of, treated by roentgen ray, 607; Pyelo-ureterography as aid in diagnosis of obscure surgical conditions of, and ureter, 608
- Killian operations, Extensive cholesteatoma following Luc-Caldwell and, 616
- Kimpton-Brown, Direct blood-transfusion with, tubes, 280
- Knee, Treatment of purulent arthritis of, by arthrostomy or marsupialization of synovial sac, 40; Loose bodies in, -joint, 263; Treatment of traumatic arthritis of, 567; Treatment of unstable cartilages of, -joint, 567
- Kyphosis, Dermatolysis and molluscum fibrosum with congenital morbus cordis and, 275
- L**ABOR, Pituitrin in, 81; Uses of pituitary extract in, 183; obstructed by ovarian cyst, 305; Management of ovarian tumors complicating pregnancy, and puerperium, 409; Anaesthesia in, 411; Rupture of uterus during, 411; Scopolamine-morphine anaesthesia in, 507; Pituitrin in, 508; obstructed by ovarian cyst, 599; Use of chloroform in first stages of, 600; Effects of nutrition of mother during pregnancy and, on condition of child, 602
- Laboratory, Study plan for diagnostic team action as, for profession, 399; Free tumor diagnosis as function of state public health, 399
- Labyrinth, New method of examining the vestibular, 515
- Lacerations, Operating during puerperium for cure of old, of cervix and perineum, 406; of cervix, 69
- Lachrymal, Digital compression of, sac in sacrocystitis of newborn, 312
- Lactation, Uncontrollable vomiting of, 602
- Lactose, Intravenous injections of, without reaction, 87
- Laminectomy, Technical features of, for spinal disease and injury, 569
- Larynx, War injuries of, and trachea, 360; Fractures of, 431; Agioma of, 517
- Laryngology, Use of radium in field of, 581
- Lavage, Treatment of chronic colon bacillus pyelitis by pelvic, 417
- Leptomeningitis, Circumscribed purulent, due to frontal sinusitis, 354
- Lesions, Changed character of later, in healed tuberculous joints, 145; Clinical considerations of, of hypophysis, 449; Diagnosis of certain surgical, of kidneys, 606
- Leucocyte count of appendicitis, 461
- Liability contract, Interpretation of physicians', 171
- Ligaments, Shurring round, 403
- Ligature, Combination needle-holder and, scissors, 129; Behavior of pancreatic ferments in blood after, of pancreatic ducts, 286
- Lingual artery, Lacing the, for secondary hæmorrhage of the tongue, 162; Ligature of, in triangles of Beclard and Pirogoff, 197
- Lip, Treatment of epithelioma of lower, 389
- Lipin content of Gaucher's disease in infant, 39
- Lipoid content of maternal and foetal blood, 508
- Lithium carbonate, Uric acid solvent power of urine after administration of piperazine, lysidin, and other alkalies, 60
- Liver, The spleen its association with, and relation to certain conditions of blood, 38; Extirpation of spleen in pathology of, and blood, 144
- Local and general anaesthesia, 19; Tonsil operation under, 98; Appendectomy under, 258; Transvesical prostatectomy under, 424
- Localization, of cerebellar tumors, 24; Exact, of foreign bodies by means of roentgen rays, 61; Cerebellar, in light of recent research, 234; Accurate method of, of foreign bodies in chest and their removal, 288; of cerebellar tumors; the pointing reaction and calorific test, 355
- Localized foreign bodies, Anatomical position of, 492
- Lower uterine segment; its origin and boundaries, 79
- Lumbar vertebra, Extraction of shrapnel bullet from third, 570



- Lung, surgery, 136; Abscess of, after tonsillectomy, 196; Phrenicotomy in treatment of some chronic diseases of, 360; Indirect traumatism of, due to nearby explosion of large war projectiles, 361; abscess following tonsillectomy, 516; Late extraction of intrapulmonary projectiles; operative technique of, surgery, 548; Removal of fragment of tracheotomy tube from, six years after inspiration, 548
- Lupus vulgaris, Use of artificial chemical light in, 572
- Lymph-glands, Bacteria associated with certain types of abnormal, 162; Experimental researches on regeneration and non-formation of, 284
- Lymphatics, Anatomic study of, of breast from viewpoint of lymphatic extension of cancer, 542
- Lymphocytosis, Importance of, of blood, 378
- Lymphosarcoma, Chylothorax, chylous ascites, and, 454
- Lysidin, Uric acid solvent power of urine after administration of piperazine, lithium carbonate, and other alkalies, 60
- MAGNESIUM**, Present status of, sulphate in treatment of tetanus, 383; Intravenous injection of, sulphate for anaesthesia in animals, 386; Experimental study of additive and antagonistic actions of sodium oxalate, and salts of, and calcium in the rabbit, 387
- Makka's operation for ectopia of bladder, 89
- Malignant, pustule treated by Baccelli's method, 378; Roentgen deep therapy in, tumors, 391; tumor of right kidney in child, 416; disease of nose or accessory sinuses; advantages of operating through face, 427; hypernephroma of ethmoidal region, 428; transformation of benign growths, 465; Deep roentgen therapy of benign and inoperable, conditions by improved technique, 491
- Malignancy, Faulty treatment of superficial, 481
- Malunited and ununited fractures, 473
- Mammary, Relation of, glands to nervousness and menstruation, 176; Tuberculosis of, 240; Acute, carcinoma, 451; Rare, tumor, 452
- Mammary: See also Breast
- Management, of complications in pregnancy, 598; of pregnancy and labor complicated by heart-disease, 598
- Mandible, Surgical procedures in gunshot fractures of, 350
- Marsupialization, Treatment of purulent arthritis of knee by arthrostomy or, of synovial sac, 40
- Mastitis, Relation between chronic, and carcinoma of breast, 451
- Mastoid, Obscure cases of, involvements, 95; Streptococcus mucosus capsulatus infection of, bone, 612
- Mastoiditis, Acute, with unusual symptoms indicative of intracranial involvement; operation; recovery, 94; Acute, with influenzal meningitis treatment by operation on mastoid and anti-influenzal serum, 94; Corroborative diagnosis of, by means of X-ray, 515; Chronic suppurative, accompanied by intracranial pressure, 515
- Maternal, Lipoid content of, and foetal blood, 508
- Maternity Hospital, Technique at Jewish, and its results, 307
- Maxillary, Treatment of, fractures, 21
- Mechanism of menstruation, Experimental researches on, 302
- Mediastinum, Experimental surgery of, excluding the heart, 59; Surgical treatment of suppurations in posterior, 545
- Mediastinal tumor treated by radiotherapy, 453
- Medicolegal, Inguinal hernia from present-day, aspect, 171
- Medullary, Effect of epinephrin on, centers, 285
- Melanosarcoma of buccal mucosa, 517
- Memmes devii, Compensatory menstruation, xenomenia, 70
- Meningitis, Acute mastoiditis, with influenzal, treatment by operation on mastoid and anti-influenzal serum, 94; Pneumococic and meningococic, after fracture of base of skull, 353; Circumscribed purulent lepto, due to frontal sinusitis, 354
- Menopause, Precocious, in virgins, 176
- Menorrhagia, Results in X-ray treatment of, dysmenorrhoea, and uterine myoma, 71
- Menstruation, Compensatory; xenomenia, memmes devii, 70; Relation of mammary glands to nervousness and, 176; Experimental researches on mechanism of, 302
- Menstrual fistula of abdomen, 404
- Mental symptoms complicating acute tetanus during treatment by carbolic injections, 282
- Mercury-lamp, Results of combined, and deep X-ray treatment of human lung tuberculosis, 61
- Metabolism, Nitrogen, during pregnancy, 304; in exophthalmic goiter, 485; studies before and after splenectomy in pernicious anaemia, 580; Basal, in disease and their importance in clinical medicine, 573
- Metastases, Glioma of cerebellum with, 24; Cancer of mouth and tongue with reference to, in neck, 517
- Methods, Practical, in diagnosis, 169; Choice of, in treatment of fractures, 474; X-ray localization of foreign bodies in eye by Sweet, 611
- Metropathies, Indications for surgery or deep roentgen-therapy for myomata and, 174
- Micrococcus melitensis, Experimental alterations produced by, 165
- Micro-organisms, Protection of pathogenic, by living tissue-cells, 384
- Midwife, Supervision of, 184
- Migraine, 96
- Military surgery, 52
- Military: See also War, Foreign Bodies, Projectiles, Bullets, Wounds
- Mitochondria, Functional significance of, in toxic thyroid adenomata, 450
- Molluscum fibrosum, Dermatolysis and, with congenital morbus cordis and kyphosis, 275
- Morbus cordis, Dermatolysis and molluscum fibrosum with congenital, and kyphosis, 275
- Morphine as an early diagnostic element in certain forms of acute appendicitis, 461
- Morphologic evolution, External genital deformity due to retardation in, 301
- Mortality, Operative, 67; Neglected appendicitis; high diagnostic and therapeutic responsibility, 257; Factors influencing, of peritonitis, 363
- Motion study in surgery, 586
- Motor nerves, Partial resection of, in spastic paralysis, 272
- Mouth, Infections of, ear, nose and throat as primary foci for secondary infections, 196; Roentgenologic examination in elimination of, as source of infection in systemic disease, 315; Cancer of, and tongue with reference to metastases in neck, 517
- Mucous membrane, Advantages of separate suture of, in gastric surgery, 551
- Muscle, Deposit in supraspinatus, simulating subacromial bursitis, 41; Tenotomy of inferior oblique, 313
- Muscular tone, Absence of, an important etiological factor in post-operative ileus, 459
- Myoma, Results in X-ray treatment of menorrhagia, dysmenorrhoea, and uterine, 71; Red, of uterus, 499
- Myomata, Indications for surgery or deep roentgen-therapy for, and metropathies, 174; X-ray treatment of uterine, 402
- Myomatous uteri, Relation of endometrium and ovary to hemorrhage from, 589
- Myopathy related to disorders of internal secretions, 481



- Myositis, Talipes equinus through, of the triceps, 154  
 Myxœdema, Scleroderma associated with Graves' disease and later, conspicuously benefited by implantation of human thyroid into bone-marrow, 238
- NÆVUS flammeus**, Treatment of, and allied conditions by filtered ultraviolet rays, employing the compression method of application, 491
- Narcosis, Sudden death in chloroform, 349; Dangers of chloroform, 446
- Nasal, Deaths attributable to intra, operations and other instrumentation, 97; Bacteriology of, sinus disease, 516; Diagnosis and treatment of inflammatory affections of the, accessory sinuses, 96; Diagnosis and treatment of inflammatory affections of, accessory sinuses, 427; Deviations of, septum and submucous operation, 613
- Nasi, Pons, 232
- Nasopharynx, Carcinomata of, 96
- Neck, Resection in projectile wounds of, 26; Congenital cysts and fistulæ of the, 350; resection in secondary period of traumatic arthritis, 357; Teratoid tumor of anterior region of, in human fetus at term, 541
- Needle-holder, Combination, and ligature scissors, 129
- Negligence, Burden of proof in actions for, 495
- Neonatorum, Treatment of ophthalmia, 81
- Nephrectomy, End-results of, 607
- Nephritis, Syphilitic, from standpoint of diagnosis and salvarsan treatment, 186; Surgical treatment of, 417
- Nephritic, Abscess of kidney cortex and its relation to para, suppuration, 416; toxæmia of pregnancy, 596
- Nephropexy, 417
- Nephrosis, Large congenital hydro, in an infant, 85
- Nerve, Complete section of left radial, nerve-suture, 49; Inclusion of radial, in cicatrix; total radial paralysis; liberation of the nerve, 49; Uniting of divided nerves, 49; supply of lower abdominal wall as related to Pfannenstiel incision, 228; Complete, sections treated by suture, 273; Suture of, and alternative methods of treatment by transplantation of tendon, 375; -sutures, 377; -blocking as practical method of anæsthesia for abdominal operations, 536; Isolation and protection of, -trunks in operations for restoration of nerves, 570; Intradural, anastomosis in selected cases of poliomyelitic paralysis, 571; Organic depression of, -cell produced by prolonged ether anæsthesia, 578
- Nervous system, Effects of high explosives upon central, 63
- Neuralgia, Diagnosis and treatment of trifacial, 537
- Neurotomy, Rosacea keratitis and other forms of marginal keratitis, neuropathic in origin, treatment by pericorneal, 94
- Newborn, Digital compression of lachrymal sac in dacryocystitis of, 312
- Nitrogen, metabolism during pregnancy, 304; Intestinal obstructions; non-coagulable, of blood, 456
- Nitrogenous constituents, Non-protein, of blood and phenolsulphonophthalein test in children, 483
- Nitrous-oxide, administration, 128; -oxygen, the most dangerous anæsthetic, 536
- Non-surgical, treatment of tuberculous glands, 133; Cancer as, disease, 571
- Nose, Bone-transplantation in, deformities, 21; Papilloma of, 96; Infections of mouth, and throat, as primary foci for infections in gastro-intestinal tract, 139; Wounds of, nasal fossæ, and accessory cavities in time of war, 195; Infections of mouth, ear, and throat as primary foci for secondary infections, 196; Treatment of diseases of accessory sinuses of, 314; Significance of hæmorrhage in operations on, and throat, 314; Malignant disease of, or accessory sinuses; advantages of operating through face, 427; Control of hæmorrhage in extensive operations on, and jaws, 427; Infection of ears, and throat as primary foci for secondary infections, 611; Sarcoma of, with metastases in cervical glands and in brain, 613
- Novocaine, Obstetrical analgesia by epidural injections of, 411; Pharmacology of, 578
- Nulliparous, Prolapse of uterus in, women, 589
- Nursing period, Duration of the, in women, 306
- Nutrition, Effects of, of mother during pregnancy and labor on condition of child, 602
- OBSTETRICS**, Analgesia and anæsthesia in, 81; Syphilis in its relation to, 82; Ideal, 185; Choice of anæsthetic and general analgesic in surgery and in, 307; Routine Wassermann reaction in hospital, 415; Results from pituitary extract in, 600; Significance of syphilis in, 603; Hæmatology in, 603
- Obstetrical, Operation for correction of deformity due to, paralysis, 49; paralysis, 509; or brachial birth palsy, 509; paralysis, 603
- Obstruction, Operative treatment of pyloric, in infants, 34; Pressure of bile secretion during chronic, of common bile-duct, 144; Treatment of general peritonitis with, 248; Intestinal, non-coagulable nitrogen of blood, 456
- Occiput, Rotation of posterior, 178
- Ocular, wounds of war, 193; Intra-, cancer sarcoma of choroid, 312; tuberculosis, 312
- Odontoid, Fracture of, process of axis, 156
- Œdema, by means of elastometer, 60; bullosum of bladder, 189
- Œsophagus, Roentgen-ray study of, 242; Removal of foreign bodies from, and bronchi with description of new instruments, 242; Serious, spasms in cancer of cardia of stomach, 362; Carcinoma of, perforating into right bronchus, 453
- Operation, Useless, 77; Open, for fractures, 373; New, for treatment of varicocele, 423; Isolation and protection of nerve-trunks in, for restoration of nerves, 570; Blood-pressures during, 574
- Operation: See also Surgery
- Operative, mortality, 67; treatment of fractures in war, 147; treatment of brachial plexus paralysis, 157; Surgical significance and, treatment of enlarged and varicose veins of spinal cord, 281; Integral, statistics of surgical service at rear, 398; Routine treatment of, acidosis, 535; Treatment of empyema of thorax, 544; Extraction of intrapulmonary projectiles, technique of lung surgery, 548; treatment of simple fractures, 565
- Ophthalmia, Treatment of, neonatorum, 81; Treatment of gonorrhœal, 81
- Ophthalmological errors in the field, 193
- Oral sepsis as focus of infection, 315
- Oral: See also Mouth
- Orbital, and peri-orbital fistulæ, 425; Radiographs of, region, 425
- Orchi-epididymitis, Paratyphoid, 422
- Orthopedic, Intra-peritoneal inoculation of animals; its diagnostic value in, surgery, 154, 477; treatment in hemiplegics of long standing, 569
- Orthopedist, Backache from viewpoint of, 480
- Os calcis, Influence of, on production and correction of valgus deformities of foot, 265; Hereditary syphilis as factor in spurs on, 371; Fracture of, 372
- Osseous, Resection of humerus for fistulous osteomyelitis, followed by, reproduction, 44; repair and proliferation, 475
- Ossification, Retarded, as etiologic factor in traumatic arthritis and epiphysitis, 40; Relation of angiogenesis to, based upon study of calcification and ossification of ovary, 73

- Osteitis, Treatment of fistulous, by polyvalent serum of Leclainche and Vallee, 374
- Osteo-arthritis, 472
- Osteochondritis, Syphilitic, 269
- Osteogenesis imperfecta, 472; Skeleton from, 561
- Osteomyelitis, Resection of humerus for fistulous, 44; involving the hip-joint, 473
- Osteoperiostic grafts taken from tibia to serve in reconstruction of bone or in repair of loss of osseous substance, 476
- Osteotomy, Overlapping joint as substitute for cuneiform, 43
- Otitis externa, 194
- Otitis media, Acute, 313; Vaccine treatment of chronic suppurative, 426; New method of opening drum membrane in purulent, by means of trephine, 612; Chronic suppurative, 612
- Otitis media: See also Ear
- Otitic origin, Pulmonary gangrene of, 135
- Otorhinology, Local anesthesia in, 231
- Ovaries, Relation of angiogenesis to ossification of, 73; Strangulated fallopian tube, and intestine in an infant, 74; Relation of endometrium and, to hæmorrhage from myomatous uteri, 589; End-result of resection of, for microcystic disease, 301; Case of supernumerary, 502
- Ovarian, Infection of, dermoid cyst with typhoid bacillus, 74; Labor obstructed by, cyst, 305; Management of, tumors complicating pregnancy, labor, and the puerperium, 409; The contents of, cysts, 502; Aspects of, secretions, 590; Labor obstructed by, cyst, 599
- Ovaritis, Bacteriology and experimental production of, 300
- Oxygen, Apparatus for administration of gas-, 18; Use of, in cystography and pyelography, 511
- PAIN**, Value of, jaundice, and tumor mass in differential diagnosis of diseases of right upper quadrant of abdomen, 470; Abdominal, when associated with abnormal temperature, 549
- Palliative, Radium a, 490
- Pancreatic, stone colic, 38; Behavior of, ferments in blood after ligation of pancreatic ducts, 286
- Pancreatitis, Serum changes and cause of death in experimental, 262; Acute hæmorrhagic, 557
- Pancreopathic, Intestinal function in, conditions, 386
- Papillæ, Unilateral hæmaturia associated with fibrosis and multiple microscopic calculi of renal, 510
- Papilloma of nose, 96
- Paralysis, Deformities due to infantile, operative treatment, 45; Non-operative treatment of infantile, 46; Inclusion of radial nerve in cicatrix; total radial, 49; Operation for correction of deformity due to obstetrical, 49; Result of astragalectomy in infantile, 153; Operative treatment of brachial plexus, 157; Stability of lower extremity in, 477; Treatment of infantile, 478; Obstetrical, 509, 603; of intestine after resection for gunshot injuries, 551
- Paralytic cell, 268
- Paranasal fossæ, Surgical consideration of upper, 614
- Parathyroid, Physiology of, glands, 26; Function of thyroid, apparatus, 134
- Parathyroidectomy, Serum changes following thyro, 238
- Paratyphoid orchio-epididymitis, 422
- Parotid, Treatment of, tumors by radium, 22
- Parto-analgesia, 413
- Parturition, in minors, 177; Analgesics in, clinical and experimental contribution, 307; Analgesics in, 411
- Pathogenesis, Anatomical and physiological subdivisions of duodenum with, of ulcer, 142; and treatment of precocious, persistent, cerebral hernia, 540
- Pathogenic, Protection of, micro-organisms by living tissue-cells, 384
- Pathology, Anatomy and, of seminal vesicles, 90; Extirpation of spleen in, of liver and blood, 144; of gas gangrene, 383
- Pathological, bases of hydrocephalus; its surgical alleviation, 23; aspects of some problems of experimental cancer, 60; diagnosis of diseases of appendix, 459; conditions about rectal outlet, 464
- Pelvis, Drainage for pus conditions in, during pregnancy, 601
- Pelvic, Spontaneous, peritonization in women, 455; Relation of rectum to female, organs, 593; Etiology of, disease in epilepsy, 592; Diagnosis of, troubles, 593
- Penis, Amputation of, for carcinoma, 422
- Percy, Multiple acute gastric ulcers after using, cold iron for inoperable carcinoma, 365; Carcinoma of uterus treated according to, method, 588
- Perforations of various abdominal organs, 139
- Performance of operations, Injury to undiseased parts in, 496
- Pericolicitis, Epiploon and, 388
- Perineum, Postpartum care of, 183; Operating during puerperium for cure of old lacerations of cervix and, 406
- Perineal, Simple after-treatment for, wounds, 301; Total ischiopubic disconnection of deep, fascia to reach deep urethra and exteriorize the prostatovesical region, 421
- Periosteum, Artificial, for fixation of shaft fractures, 41
- Peripheral, nerves, Gunshot injuries of, syndrome of compression, 156
- Peristalsis, Normal stomach; size, position, form, tone, and mobility from a radiographic standpoint, 287
- Peritoneum, Gelatinoid carcinoma of, 248
- Peritoneal, adhesions; prevention with citrate solutions, 31, 32; Antiseptic action of ether in, infections, 248; Inter, adhesions, 549
- Peritonealizing, Infolding and, stitch with application of same to broad ligament and gall-bladder, 346
- Peritonitis, Treatment of general, with obstruction, 248; Factors influencing mortality of, 363
- Peritonization, Spontaneous pelvic, in women, 455
- Peroral bronchoscopy, Endothelioma of right bronchus removed by, 547
- Perthe's disease, Causes and treatment of, 561
- Pfannenstiel incision, Nerve supply of lower abdominal wall as related to, 228
- Phalangeal, Arthroplasty of inter, joints, 265
- Phantom tumors, 51
- Pharmacology of novocaine, 578
- Pharynx, Carcinomata of naso, 96
- Pharyngeal, Cranio, duct tumors, 233
- Phenolsulphonaphthalein, estimation of renal function, 87; Non-protein nitrogenous constituents of blood and, test in children, 483
- Phlebitis migrans, 414
- Phloridzin, Effect of, on tumors in animals, 59
- Phrenicotomy in treatment of some chronic diseases of lung, 360
- Physicomechanical function of faucial tonsil, 430
- Physiology of parathyroid glands, 26
- Physiological, Treatment of infected wounds by, methods, 584
- Pillar-compression forceps for controlling hæmorrhage following tonsillectomy, 20
- Pineal gland, 284
- Piperazine, Uric acid solvent power of urine after administration of, lysidin, lithium carbonate, and other alkalies, 60
- Pituitrin in labor, 81, 508



- Pituitary, feeding upon growth and sexual development, 131; Action of, extract, 159; Uses of, extract in labor, 183; fossa and surgical methods of approaching it, 235; Cesarean section; high forceps, 303; Influence of tetelin and other alcohol-soluble extractives from anterior lobe of, body upon growth of carcinomata in rats, 385; extract, 599; Results from, extract in obstetrics, 600
- Pituitary: See also Hypophysis
- Placenta, Miliary tuberculosis of, with clinically latent tuberculosis of mother, 185; Hæmorrhage associated with partial and complete detachment of normally implanted, 304; Present conditions in treatment of hæmorrhages due to low insertion of, 599; Results of routine study of, 602
- Plasterers' corns and bunions, 145
- Plastic, surgery a lost art, 175; of penetrating cheek defects due to gunshot injuries, 232
- Pleura, Primary tumors of, 452; Extraction of free bullets from left, 452
- Pleural cavity, Extraction of piece of grenade from, by electromagnet, 359
- Pneumonia, Relation of ether, to pelvic and abdominal surgery, 593
- Pneumothorax, Extraction of free bullets from left pleura after establishment of artificial, 452; Roentgenographic control of, treatment of pulmonary tuberculosis, 491
- Poisons, Tissue cellular protein, 161
- Poliomyelitic paralysis, Intradural nerve anastomosis in, 571
- Polygram, Use of, in gastroduodenal diagnosis, 390
- Polyposis of colon, 143
- Pons nasi, 232
- Post-natal care of surgical patient, 59
- Postmortem cesarean section, 505
- Postoperative, ileus, 367; tetanus, 164; treatment of peptic ulcer and cholecystitis, 251; management of pyloric stenosis, 252; Clinical and experimental study of, ventral hernia, 347; Pre- and , care, 347; Absence of muscular tone an important etiological factor in, ileus, 459; treatment in rectal surgery, 536
- Postpartum care of perineum, 183
- Postpuerperal sterility, 590
- Posture, Clinical relations of gravity, and circulation, 293
- Pott's disease treated by bone-graft, 44
- Precocious menopause in virgins, 176
- Pregnancy, Systolic blood-pressure in, 80; Uncontrollable vomiting of, 177; Histologic physiopathologic research on internal secretion of pancreas in, 184; Nitrogen metabolism during, 304; Fibroids complicating, 305; Pyelitis in, 309; Pyelitis of, with relation to its etiology, 409; Treatment of extra-uterine, in advanced periods, 407; in tuberculous, 409; Management of ovarian tumors complicating, labor, and puerperium, 409; False appendicitis in, 410; Interstitial, 505; complicated by syphilis, 506; Blood ferments in, 506; toxæmia, 504, 506; Nephritic toxæmia of, 506; Acidosis complicating, 597; Care of women during, 598; Management of complications of, 598; Management of, and labor complicated by heart-disease, 598; Urinary diagnosis of, 601; Drainage for pus condition in pelvis during, 601; Value of Wassermann test in, 601; Gunshot wounds in abdomen in, 507; Effects of nutrition of mother during, and labor on condition of child at birth and for first few days of life, 602
- Preservation of living red blood-cells in vitro, 52
- Pressor, Appearance of, substance in fetal hypophysis, 388
- Pressure, Symmetrical, fibromata, 472
- Primary tumors of pleura, 452
- Privilege, Waiver of, 496
- Procidencia, Vaginal hysterectomy for, 501
- Prognosis of prostatitis, 92
- Projectiles, Surgical extraction of intrapulmonary, 30, 136; Treatment of head injuries from, 129; Extraction of, from brain; use of Bergonie electrovibrator, 131; Operative technique of extraction of, under guidance of Hirtz compass, 170; Removal of, by thoracotomy, 359; Operative extraction of intrapulmonary, 361; penetrating and lodging in the heart, 361; Three juxtacardiac, extracted by different procedures, 361; in right lobe of heart after traversing cava inferiore, 453; Traumatic stricture of urethra by, with unexpected trajectory, 513
- Projectile: See also Shell, Bullet, Wound, Gunshot
- Prolapse, Treatment of genital, 405; Treatment of uterine, 500; Etiology of uterine, and cystocele, 500; of uterus in nulliparous women, 589; New and simple operation for uterine, 591; of kidney, surgical replacement, 510
- Prolapse: See also Displacement
- Prolapsus ani, Bloodless operation for hæmorrhoids and, 261; in adults, 466
- Proliferation, Osseous repair and, 475
- Prophylaxis, Etiology and, of cancer, 50; of uterine cancer, 173
- Prophylactic, use of tetanus antitoxin, 282; Result of, vaccination against tetanus, 382
- Prostate gland, Calcareous degeneration of, 423
- Prostatectomy, Suprapubic, 423; Transvesical, under local anæsthesia, 424; Diabetes and, 424; Internal sphincter following, 514
- Prostatic, Urinary retention due to, obstruction, 514
- Prostatics, Calculi of vesicoprostatic region in old, 423
- Prostatitis, Prognosis of 92
- Prostatovesical, Total ischiopubic disconnection of deep perineal fascia in order to reach deep urethra and exteriorize the, region, 421
- Protection, Isolation and, of nerve-trunks in operations for restoration of nerves, 570
- Protein poisons, Tissue cellular, 161
- Protozoa, Effects of cancer tissue and normal epithelium on vitality of, 273
- Pruritus ani, 555
- Pseudo-appendicitis, 552; Urticaria and, 67
- Pseudohermaphroditism with abnormal function of endocrine glands, 175
- Psychiatry and gynecology, 302
- Puerperium, Fatal rupture of bladder during, 305; Operating during, for cure of old lacerations of cervix and perineum, 406; Management of ovarian tumors complicating pregnancy, labor, and, 409
- Puerperal, Treatment of, sepsis by uterine suction and drainage, 305; infection, 413; Post-, sterility, 590; Frequency of, eclampsia, 596
- Pulmonary Surgical extraction of intra, projectiles, superficial and deep, under screen, 30, 136; Roentgenographic diagnosis of, tuberculosis, 135; gangrene of otitic origin, 135; Radiographic diagnosis of metastatic, malignancy, 241; Operative extraction of intra, projectiles, 361; Roentgenographic control of pneumothorax treatment of, tuberculosis, 491; Indications for extraction of, intra, projectiles, 547; End-results of pleuro, wounds by war projectiles, 548; Late extraction of intra, projectiles, 548
- Purgatives, Abdominal pain when associated with abnormal temperature and indication for caution in use of, 549
- Pus, Study of, in war surgery; by pyoculture method of Delbet, 493; Drainage for, conditions in pelvis during pregnancy, 601



Pustule, Malignant, treated by Baccelli's method, 378  
 Pyelitis, in pregnancy, 309; of pregnancy with relation to its etiology, 409; Treatment of chronic colon bacillus, by pelvic lavage, 417  
 Pyelography, New medium for, 63; Danger of, 86; Thorium a new agent for, 492; Use of oxygen in cystography with preliminary report on use of oxygen in, 511  
 Pyelo-ureterography as aid in diagnosis of obscure surgical conditions of kidney and ureter, 608  
 Pyloric, Operative treatment of, obstruction in infants, 34; Ulcer of duodeno, fornix, 35; exclusion, 142; Perforating, and duodenal ulcers, 252; Post-operative management of stenosis, 252  
 Pyocyanus, Chronic general infection with bacillus, 58  
 Pyogenic kidney, Urine stasis in etiology of, infections, 84  
 Pyuria, causes and diagnosis, 308

**Q**UININE and urea injections in hyperthyroidism, 236

**R**ADIUM, Treatment of parotid tumors by, 22; physics, 62; Action of, on transplanted tumors of animals, 62; Therapeutic effects of, 63; treatment of uterine fibroids, 70; achievements, 166; treatment, 288; Comparative value of roentgen and, radiation in therapeutics, 390; Primary carcinoma of urethra, retention of urine from obstruction; restoration of function by, 421; a palliative, 490; Therapeutic value of, in pelvic cancers, 580; Actinomycosis cured with, 580; Use of, in field of laryngology, 581

Radium: See also X-ray, Roentgen

Radius, Homoplastic transplantation of boiled segment of, 44; Isolated fractures of head of, 473; Subluxation of head of, 566

Radio-activity as therapeutic agency, 286

Radiodiagnosis of appendicitis, 552

Radiograms, Uses and limitations of stereoscopic, in diagnosis of injury to, bone, 287

Radiographs of orbital region, 425

Radiography, of chest in children, 166; in gunshot wounds of skull, 232; in diagnosis of diseases of accessory nasal sinuses, 428

Radiographic, diagnosis of metastatic pulmonary malignancy, 241; Normal stomach; size, position, form, tone, peristalsis, and mobility from a, standpoint, 287

Radioscopic, Operative extraction of intrapulmonary projectiles under, screen, 136

Radiotherapy, Mediastinal tumor treated by, 453

Railway injuries, Immediate and after-treatment of, 228

Reactions of blood-vessels to certain chemicals, 488

Rectum, Radical operation for cancer of, and rectosigmoid, 36; Complete removal of intestine, and colon pelvinum for carcinoma, 259; Spasmodic stricture of, 464; How to examine, 465; Relation of, to female pelvic organs, 503; Diagnosis of cancer of, 554

Rectal, Genito-urinary symptoms arising from anal, and colonic diseases, 93; Ano, fistula, 259; Ischio, abscess from fish-bone, 259; anaesthesia, 349; Pathological conditions about, outlet, 464; Ano, injuries, 465; Postoperative treatment in, surgery, 536

Rectovaginal septum, Adenomyoma of, 405, 594

Recurrence of symptoms after operation for gall-stone disease, 467

Reduction, immediate, of fractures, 373; of disabilities from wounds in war, 585

Regeneration, Experimental researches on, and neoformation of lymph-glands, 284; of long bones following infection, 472; of bone, 561

Renal, periods of amelioration in, tuberculosis, 86; Phenol-sulphonephthalein estimation of, function, 87; Betterment in, tuberculosis, 186; Pain in, and vesical lesions, 188; tumors in rabbit, 274; Diagnosis and treatment of, tuberculosis, 310; Variations in, function dependent on surgical procedures, 419; Experimental, sporotrichosis, 487; Diagnosis of, and ureteral calculi, 608

Research, Histologic physiopathologic, on internal secretion of pancreas in pregnancy, 184; Histochemical, regarding function of decidua, 306; on secondary suture of war wounds, 494

Resection, in projectile wounds of neck, 26; Submucous, of nasal septum, 97; Partial, of motor nerves in spastic paralysis, 272; End-result of, of ovaries for microcystic disease, 301; of elbow in war surgery, 374; Paralysis of intestine after, for gunshot injuries, 551; Primary, in treatment of articular gunshot wounds with fracture, 566; of shoulder in war surgery, 566

Respiratory tract, Foreign bodies in, 360

Responsibility for loss of drainage tube in body of child, 497

Results, of combined mercury-lamp and deep X-ray treatment of human lung tuberculosis, 61; in X-ray treatment of menorrhagia, dysmenorrhoea, and uterine myoma, 71; Method of testing antiseptics for wounds with some, 230; of treatment of acute appendicitis, 368; of fractures of os calcis, 372; obtained from employing Carrel's method in war surgery, 494; Surgical considerations of splenectomy and its, 558; obtained by early and systematic disinfection of war wounds, 583; from pituitary extract in obstetrics, 600; of routine study of placenta, 602; End-, of nephrectomy, 607

Resuscitation apparatus, 537

Retention of urine, Primary carcinoma of urethra, from obstruction, restoration of function by radium, 421

Retrocæcal, Treatment of, appendix, 462

Retrocession, Dysmenorrhoea, with antelexion and, 590

Retrodisplacement, Operation in various cases of, of uterus, 71, 402

Retropharyngeal abscess discharging into left bronchus, 196

Retroversion, Simple method of shortening the round ligaments of uterus for cure of, 296

Rhinolith, Removal of large, 613

Rhinology, Local anaesthesia in oto, 231

Ribs, Cervical, 132

Rickets, 271

Right ventricle, Extraction of piece of shell from, 453

Roentgen, studies after gastric and intestinal operations, 34; treatment of deep-seated cancer, 62; treatment of uterine carcinoma, 174; examination of appendix, 256; Negative and positive, diagnosis of gall-stones, 370; Comparative value of, and radium radiation in therapeutics, 390; diagnosis of obscure lesions of gastro-intestinal tract, 391; deep therapy in malignant tumors, 391

Roentgen-ray, diagnosis of gastric lesions, 33; Exact localization of foreign bodies by means of, 61; plates may be shown to injuries, 171; study of oesophagus, 242; Gall-stone diagnosis by, 262; Gastro-intestinal examination by, 288; Treatment of tuberculous adenitis by, 389; in dental practice, 431; Sarcoma of kidney treated by, 607

Roentgenographic, findings in gastro-intestinal tract, 33; diagnosis of pulmonary tuberculosis, 135; control of pneumothorax treatment of pulmonary tuberculosis, 491

Roentgenology, Value of, in treatment of bone and joint tuberculosis, 581



- Roentgenologic, examination in elimination of mouth as source of infection in systemic disease, 315; diagnosis of duodenal ulcer, 366
- Roentgenoscopic examination of stomach and duodenum, 167
- Roentgentherapy, Filter for deep, 61; Indications for surgery or deep, for myomata and metropathies, 174; Deep, of benign and inoperable malignant conditions by improved technique, 491
- Rotation of posterior occiput, 178
- Round ligaments, Simple method of shortening the, of uterus for cure of retroversion, 296; Shirring of, 403; Shortening of, by transverse suprapubic incision, 502
- Rubber gloves, Experiments with, 347
- Rupture, Accidents due to, or abortion of simultaneous tubal pregnancies, 177; Fatal, of bladder during puerperium, 305; Traumatic, of ciliary arteries, 312; of uterus during labor, 411; of bladder associated with fracture of pelvis, 512; Spontaneous, of digestive tube, 550; of scar of previous cæsarean section, 596
- S**ACRAL autonomies, Pharmacology of ureter; action of drugs affecting, 311
- Saline solution, Uses and abuses of normal, 277
- Salpingectomy, Tubal sterilization; pregnancy following bilateral, 403
- Salpingitis, secondary to appendicitis, 74; End-results in cases operated for, 503
- Salvarsan treatment, Syphilitic nephritis from standpoint of diagnosis and, 186
- Sarcoma, of base of skull, 234; of tonsil, 430; of scapula, 542; of kidney treated by roentgen ray, 607; of nose with metastases in cervical glands and in brain, 613; in unusual situations, 158
- Scapula, Fractures of neck of, 41; Congenital bilateral elevation of, 46; Congenital elevation of, 147; Sarcoma of, histological diagnosis made by study of blood aspirated from pulsating portion of tumor, 542
- Scarlatina, Etiology of surgical, 51
- Scars, Treatment of, 484
- Scissors, Combination needle-holder and ligature, 129
- Sclayer's kidney test, Intravenous injections of lactose without reaction, 87
- Sclerocorneal trephining in glaucoma, 515
- Scleroderma associated with Graves' disease benefited by implantation of human thyroid into bone-marrow, 238
- Sclerotics, Blue, their relation to multiple fractures in childhood, 472
- Scoliosis, 155; Treatment of, 480
- Scopolamine and narcophine, Shockless surgery with help of paravertebral anæsthesia with, 231
- Scopolamine-morphine anæsthesia in labor, 507
- Scrotal affections, Inguinal incision for intra, 191
- Secondary, closing of wounds, 65; Researches on, suture of war wounds, 494; union of war wounds by first intention, 494
- Secretions, Aspects of ovarian, 590; Nature of bactericidal property of vaginal, 592
- Secretory disorders, Diagnosis of internal, 573
- Section, Anatomoclinical study of total, of spinal cord, 47; Complete, of left radial nerve; nerve-suture, 49; Cæsarean, 407
- Segmental cæsarean operation, 408
- Semicircular apparatus of ear and cerebellar localization as diagnostic key to intracranial conditions, 194
- Seminal, Anatomy and pathology of, vesicles, 90; Treatment of non-tuberculous inflammations of, duct, 91; Tuberculosis of, vesical and epididymis, 91; vesiculitis, 513
- Sensitized serums, Immunity conferred by transfer of immune and mixed immune and, 574
- Sepsis, Treatment of puerperal, by uterine suction and drainage, 305
- Septic, Physics of surgical dressing with use of impermeable material over, wounds, 17; Sodium hypochlorite in treatment of, wounds, 66; Treatment of wounds with drainage, 292; Treatment of, war wounds by abstention, 583
- Septum, Submucous resection of nasal, 97; Deviations of nasal, and submucous operation, 613
- Sera, Antagonistic action of negative, upon Wassermann reaction, 276
- Serum, Treatment of gonococcic conjunctivitis by antigenococcic, 94; changes following thyroparathyroidectomy, 238; changes and cause of death in experimental pancreatitis, 262; Treatment of fistulous osteitis by polyvalent, of Leclainche and Vallée, 374; Immunity conferred by transfer of immune and mixed immune and sensitized, 574
- Serotoxin of Jobling, 276
- Seven-glass urinary test, 418
- Sex-gland implantation, 424
- Sexual development, Pituitary feeding upon growth and, 131
- Sheet rubber superior to gauze sponges in abdominal operations, 535
- Shirring round ligaments, 403
- Shock, Cytological analysis of, 578; -less surgery with help of paravertebral anæsthesia with scopolamine and narcophine, 231
- Shortening, Simple method of, round ligaments of uterus for cure of retroversion, 296; of round ligaments by transverse suprapubic incision, 502
- Shoulder, Resection of, in war surgery, 566
- Shrapnel bullet, Extraction of, from third lumbar vertebra, 570
- Sialodochitis, Sialolithiasis and, in childhood, 197
- Siamese twins, 415
- Sigmoid, Radical operation for cancer of rectum and recto, 36; Acute angulation and flexure of, 463
- Sigmoidoscopic, Position for, work, 463
- Sinus, thrombosis in compression, 130; Lateral, thrombosis, 194; Bacteriology of nasal, disease, 516; Brain abscess from chronic suppuration of frontal, 614; Diagnosis and treatment of inflammatory affections of nasal accessory, 96, 427; Treatment of diseases of accessory of nose, 314; Malignant disease of nose or accessory, advantages of operating through face, 427; Radiography in diagnosis of diseases of accessory nasal, 428; Bismuth paste in chronic suppurative, and empyema, 545
- Sinusitis, Circumscribed purulent leptomeningitis due to frontal, 354
- Skeleton from osteogenesis imperfecta, 561
- Skiaigraphy, Diagnosis of fracture by physical examination versus, 263
- Skill and care required, 171
- Skull, Radiography in gunshot wounds of, 232; Sarcoma of base of, 234; Pneumococcic and meningococcic meningitis after fracture of base of, 353; Thyroid tumors of bones with reference to non-malignant pulsating tumors of, 354
- Sluder method of tonsil enucleation, 196, 430
- Snare and bullet, New hemorrhagic operation, 261
- Sodium, hypochlorite in treatment of septic wounds, 66; Experimental study of use of, citrate in transfusion of blood, 379; Experimental study of additive and antagonistic actions of, oxalate and salts of magnesium and calcium in the rabbit, 387

- Soldier's foot and treatment of common deformities of foot, 479
- Solutions, Simple method of giving, by bowel, 229
- Spasm, Tetanus-like, localized to wounded limb, 289
- Spasmodic stricture of rectum, 464
- Spastic paralysis, Partial resection of motor nerves in, 272
- Sphagnum moss, Methods of preparing, as surgical dressing, 228
- Sphincter, Internal, following prostatectomy, 514
- Spine, Injuries of lower, 155; Coagulation massive and xanthochromic occurring in tuberculosis of cervical, 156; Congenital anterior curvature of, 270; Gunshot wounds of, 270; Treatment of gunshot wounds of, 271; Handling of children with tuberculosis of, while under influence of anæsthetic, 480; Treatment of caries of, by bone-transplantation, 570
- Spina bifida, 47
- Spinal, anæsthesia, 19; Bone-grafting for, conditions, 47; Anatomical study of total section of, cord, 47; Visceroptosis to, lesions, 154; anæsthesia, 230; Gunshot wounds and injuries of, cord, 271; Surgical significance and operative treatment of enlarged and varicose veins of, cord, 281; Injuries of, cord with gunshot injury of cord at fourth cervical vertebra and successful removal of projectile, 377; Manual expression of bladder in, injury, 421; anæsthesia, 446; Technical features of laminectomy for, disease and injury based on 150 spinal operations, 569
- Spleen, Association of, with liver and its relation to certain conditions of blood, 38; Extirpation of, in pathology of liver and blood, 144; Concretions of, 144
- Splenectomy, for wounds, 370; Technique of, 557; Treatment by, of splenomegaly with anæmia associated with syphilis, 557; Surgical considerations of, and its results, 558; Metabolism studies before and after, in pernicious anæmia, 560
- Splenectomized, Lethal dose of arsenic for, mice, 580
- Splints, Fracture, 232; for drop-wrist, 475
- Splinting, Device for intramedullary fracture, 43
- Spondylitis, Cervical, of doubtful nature, 155; Experience with Albee operation for, tuberculosis, 477
- Spontaneous pelvic peritonization in women, 455
- Sporotrichosis, Experimental renal, 487
- Sprains and sprain-fracture of the wrist-joint, 564
- Spurs, Hereditary syphilis as factor in, on os calcis, 371
- Standardization, Fracture records; effort towards, 146
- Staphyloma, Operative treatment of partial of cornea and fistula of cornea, 611
- Stasis, Intestinal, 256; High intestinal, 458; Hernia in relation to intestinal, 455; Experimental colonic, 462
- Steam, Superheated, in treatment of superficial cancer, 572
- Stenosis, Adjustment of intra-uterine stem versus dilatation to overcome, of cervical canal, 173; Congenital, of duodenum in adult, 456
- Stercobilin, 387
- Sterility, in female, 406; Causes and treatment of, in women, 503; Postpuerperal, 590
- Sterilization, Tubal, 403; of war wounds, 493
- Stillbirths, Bacteriologic study of causes of some, 509
- Stomach, Aids in diagnosis of surgical conditions of, characteristic X-ray appearance of syphilitic hour-glass in contrast to simple ulcer and cancer, 32; Treatment of diseases of, 34; Acute dilatation of, complicating operations on extremities, 127; Roentgenoscopic examination of, and duodenum, 167; Ionic concentration of gastric contents in some, diseases, 249; Normal, from radiographic standpoint, 287; Serious esophagic spasms in cancer of cardia of, 362; Occult bleeding in ulcer ventriculi and, carcinoma, 364; Surgery of posterior wall of, 365; Perforated ulcers of, and duodenum, 550; Diagnosis of cancer of, 551
- Stomach: See also Abdomen
- Stone, Pancreatic, colic, 38
- Strangulation, Retrograde, 364
- Strangulated fallopian tube, ovary, and intestine in an infant, 74
- Streptococcus mucosus capsulatus infection of mastoid bone, 612
- Stricture, Ureteral, 87; Congenital, of urethra, 421; Traumatic, of urethra by projectile, 513
- Strumitis, Eberthian, 541
- Stumps, After-treatment of amputation, 268; Aperiosteal, and its care, 476
- Subacromial bursitis, Deposit in supraspinatus muscle simulating, 41
- Subluxation of head of radius, 566
- Submaxillary, Calculi in, gland and Wharton's duct, 21
- Submucous, Improved, operation, 98; resection of nasal septum, 97; Deviations of nasal septum and, operation, 613
- Subungual exostosis, 40
- Suction, Curved lines of, 604
- Supernumerary, ureter, 311; Ovaries, 502
- Suppurations, Surgical treatment of, in posterior mediastinum, 545
- Suppurating, Treatment of, wounds in war, 66
- Suppurative, hæmatoma of iliac fossa, 277; Treatment of, appendicitis, 462; Chronic, mastoiditis accompanied by intracranial pressure, 515; Therapeutics of chronic non-tuberculous, bronchiectasis, 546; Chronic, otitis media, 612
- Suprapubic prostatectomy, 423
- Suprasympyseal, Transperitoneal, cesarean section on account of scariform growth in vagina, 304
- Surgeon's responsibility to economics of the hospital, 585
- Surgery, Experimental, of mediastinum, 59; Lung, 136; Plastic, 175; Acidosis in, 275, 573; Time in, 283; in war, 392; Influence of syphilis upon 573; Motion study in, 586
- Surgical, Non-adhering, gauze, 17; Physics of, dressing, 17; Etiology of, scarlatina, 51; Methods of preparing sphagnum moss as, dressing, 228; uses of celluloid, 231; Pituitary fossa and, methods of approaching it, 235; Acute, abdomen, 245; Care of abdominal, cases, 247; Management of, disorders of digestion, 255; aspects of painful back, 272; War, interventions, 397; Integral operative statistics of, service at rear, 398; treatment of nephritis, 417; Variations in renal function dependent on, procedures, 419; Thoracic disease; the status of, therapy, 543; Vaccine treatment in, cases, 574; Treatment of, tuberculosis with general carbon arc light bath, 582
- Suspension, Treatment of fractures by, and extension, 474
- Suture, Complete nerve sections treated by, 273; Intradermic, 346; of nerves and alternative methods of treatment by transplantation of tendon, 375; Nerve-, 377; Advantages of separate, of mucous membrane in gastric surgery, 551
- Sweet, X-ray localization of foreign bodies in eye by, method, 611
- Symmetrical pressure fibromata, 472
- Sympathetic system in diagnosis of abdominal diseases, 400
- Synovial sac, Treatment of purulent arthritis of knee by arthroscopy or marsupialization of, 40
- Syphilis, of internal genital organs in female, 74; in its relation to obstetrics, 82; Hereditary, as factor in spurs on os calcis, 371; Necessity for early diagnosis and continuous treatment in congenital, 426; Preg-



- nancy complicated by, 506; Treatment by splenectomy of splenomegaly with anaemia associated with, 557; Influence of, upon surgery, 573; Significance of, in obstetrics, 603
- Syphilitic, Aids in diagnosis of surgical conditions of stomach with characteristic X-ray appearance of, hour-glass in contrast to simple ulcer and cancer, 32; Unrecognized, lesions surgically operated as cancer or local tuberculosis, 67; osteochondritis, 269
- TALIPES** equinus through myositis of triceps, 154
- Tarsus, Arrested development of carpus and, 263
- Technique, Operative, of extraction of projectiles under guidance of Hirtz compass, 170; by which conservatism is possible in diseases of adnexa, 174; of enucleation thyroidectomy, 238; at Jewish Maternity Hospital and its results, 307; of tracheotomy in adult, 545; of splenectomy, 557
- Tendon-transplantation, 375; in infantile paralysis, 45
- Tenotomy of inferior oblique muscle, 313
- Teratoid tumor of anterior region of neck in human foetus at term, 541
- Teratomata of brain, 540
- Test, Quantitative, of Abderhalden reaction, 78; Seven-glass urinary, 418
- Testicle, Varicocele operated upon by high suspension of, 191; Treatment of undescended, 422; Treatment of gunshot wounds of, 422
- Tetanus, 577; Delayed, 58; Treatment of, 58; Post-operative, 164; as a surgical complication in present war, 282; Prophylactic use of, antitoxin, 282; Iodine in, 282; Mental symptoms complicating acute, during treatment by carbolic injections, 282; spasm localized to wounded limb, 289; Localized, 381; Result of prophylactic vaccination against, 382; Present status of magnesium sulphate in treatment of, 383
- Tethelin, Effects of, 286; Influence of, upon growth of carcinomata in rats, 385
- Therapeutic, effects of radium, 63; Radio-activity as, agency, 286; Method of action of antiseptics and procedures for determination of their value, 348; Comparative value of roentgen and radium radiation in, 390; of non-tuberculous suppurative bronchiectasis, 546; value of radium in pelvic cancers, 580
- Thigh, Treatment of fractures of, in war surgery, 371
- Thorax, Gunshot wounds of, 28; Recent progress in operative treatment of, 544; Chylo, 544; Surgical therapy of diseases of, 543
- Thoracotomy, Removal of projectiles by, 359
- Thorium, a new agent for pyelography, 492
- Throat, Significance of hæmorrhage in operations on nose and, 314; Infections of, as primary foci for secondary infections, 611
- Throat: See also Larynx
- Thrombin, Pro-, and anti-thrombin factors in coagulation of blood, 161
- Thrombosis, Venous, and embolism, 54; Sinus, in compression, 130; Lateral sinus, 194; Treatment of, 575
- Thrombo-angitis obliterans; Conservative treatment of gangrene of extremities due to, 53; Operative treatment, of 55
- Thymus, Enlarged, in infancy, 29; and its tumors, 240; Alterations of endocrine glands, especially the, and of blood following vagotomy, 490
- Thymic disturbances in adult, 135
- Thyroid, Tonsillar endamebiasis and, disturbance, 26; tumor in sea bass, 237; Carcinoma of, in fish, 237; Scleroderma associated with Graves' disease and benefited by implantation of human, into bone-marrow, 238; tumors of bones with non-malignant pulsating tumors of skull, 354; Anatomy and surgery of, glands, 449; Functional significance of mitochondria in toxic, adenomata, 450
- Thyroidectomy, Technique of enucleation, 238
- Thyroidism, Blood-pressure in dys-, 134
- Thyroidparathyroid, Function of, apparatus, 134
- Thyroidparathyroidectomy, Serum changes following, 238
- Thyrotomy, Partial excision of thyroid cartilage as alternative to, in malignant disease of vocal cord, 315
- Tibia, Fracture of tuberosities of, 372
- Tissue, cellular protein poisons, 161; Reactions between bacteria and animal tissues under conditions of artificial cultivation with bactericidal action in, cultures, 163
- Toluol as a storing fluid for catgut, 128
- Tongue, Tuberculosis of, 98; Lacing the lingual artery for secondary hæmorrhage of, 162; Cancer of mouth and, 517
- Tonsil, operation under local anæsthesia, 98; Removal of, and adenoids in diphtheria carriers, 98; question, 195; Treatment of, 195; Sluder method of, enucleation, 196; Sarcoma of, 430; Physicomechanical function of faucial, 430; enucleations with Beck-Pierce tonsillectome, 431
- Tonsillar, endamebiasis and thyroid disturbance, 26; Secondary hæmorrhage, 516
- Tonsillectomy, Pillar-compression forceps for controlling hæmorrhage following, 20; Age in, 98; Abscess of lung after, 196, 516; According to Sluder technique, 430; as a new method of tonsil eradication, 516
- Tonsillitis, Cerebral abscess due to suppurative, 131
- Tonsilloscope, 429
- Torula infection in man, 400
- Toxæmia, Pregnancy, 504, 596; Nephritic, of pregnancy, 596
- Toxicity, Inhibition of, of anæsthetics for nephropathic kidney, 128
- Toxin, Sero, of Jobling, 276
- Trachea, War injuries of larynx and, 360
- Tracheotomy, Technique of, in adult, 545; Removal of fragment of, tube from lung six years after inspiration, 548
- Transfusion, 483; Reaction following blood, by syringe cannula system, 55; Preservation of living red blood-cells in vitro, of kept cells, 56; Relation of hæmoly-sis in, of babies with mothers as donors, 56; Continuous, in production of immunity, 161; Indications for blood, 278, 279; Testing donors for, of blood, 279; Blood-, in treatment of post-hæmorrhagic anæmia and hæmorrhagic diseases, 279; Direct blood-, with Kimpton-Brown tubes, 280; Blood-, 379; Experimental study of use of sodium citrate in, of blood by direct and indirect methods, 379; Blood-, in hæmorrhage of newborn, 604
- Transitional, Origin and status of, white blood-cell, 160
- Transperitoneal suprasymphysal cesarean section on account of scariform growth in vagina, 304
- Transplants, Repair of losses of frontal substance by means of cartilaginous, 22
- Transplantation, Bone-, in nose deformities, 21; Homoplastic, of boiled segment of radius, 44; Tendon-, in infantile paralysis, 45; of bone in ununited fractures of shaft of humerus, 264, 568; of tissue, 267; Tendon-375; Suture of nerves and alternative methods of treatment by, of tendon, 375; Important points in bone-, 476; of bone and some uses of bone-graft, 568
- Transplanted, Action of radium on, tumors of animals, 62
- Transverse process, Fracture of lumbar vertebræ and, 155
- Transverse suprapubic incision, Shortening of round ligaments by, 502
- Transvesical prostatectomy under local anæsthesia, 424



- Trapezius, Repair of breach of, and splenius with cicatrix adhering to cervical vertebrae, 374
- Traumatisms, Indirect, of lung due to nearby explosion of large war projectiles, 361
- Traumatic, aneurisms, 380; Treatment of, arthritis of knee, 567
- Treatment, Vaccine, 276; Radium, 288; Physical, for disabled soldiers, 291; Principles of, and their application to wounds, 292; Painless, rational, and economic, of wounds, 292; of thrombosis, 575; of wounds in civil practice, 577; of surgical tuberculosis with general carbon arc light bath, 582
- Trepine, New method of opening drum membrane in purulent otitis media by means of, 612
- Triangles, Ligation of lingual artery in, of Beclard and Pirogoff, 197
- Triceps, Talipes equinus through myositis of, 154
- Trifacial, Diagnosis and treatment of, neuralgia, 537
- Trigonitis, Chronic, 311
- Trophic element in origin of gastric ulcer, 140
- Tube, Strangulated fallopian, ovary and intestine in an infant, 74; Surgical treatment of gonorrhoeal, infection with quarantine pack, 77
- Tubal, Accidents due to rupture or abortion of simultaneous, pregnancies, 177; sterilization, 403
- Tuberculosis, Results of combined mercury-lamp and deep X-ray treatment of human lung, 61; Experimental grounds for treatment of lung, by X-rays, 61; Unrecognized syphilitic lesions surgically operated as cancers or as local, 67; Periods of amelioration in renal, 86; of seminal vesical and epididymis, 91; Diagnosis and prognosis of urogenital, 92; of the tongue, 98; Roentgenographic diagnosis of pulmonary, 135; Coagulation massive and xanthochromie occurring in, of cervical spine, 156; Miliary, of placenta with clinically latent tuberculosis of mother, 185; Betterment in renal, 196; Diagnosis of genito-urinary, 192; of mammary gland, 240; Diagnosis and treatment of renal, 310; Ocular, secondary to industrial accident, 312; of breast, 358; Necessity for operation in joint, 475; Experience with Albee operation for spondylitis, 477; Handling of children with, of spine, 480; Treatment of surgical, with carbon arc light bath, 582
- Tubercular bacillæmia, 388
- Tuberculous, Treatment of non-, inflammations of seminal duct, 91; Non-surgical treatment of, glands, 133; Changed character of later lesions occurring in healed, joints, 145; Treatment of chronic non-, empyema, 240; Treatment of, adenitis by roentgen rays, 389; Pregnancy in, 409; Treatment of abscesses in, diseases of joints and bones, 475; Autogenous bone-splints in fractures and, spines, 568
- Tuberosities, Fracture of, of tibia, 372
- Tumors, Treatment of parotid, by radium, 22; Localization of cerebellar, 24; of carotid body, 25; Classification of, 51; Phantom, 51; Effect of phloridzin on, in animals, 59; Action of radium on transplanted, of animals, 62; Cauterization and fulguration of bladder, 89; Cranio-pharyngeal duct, 233; Thyroid, in sea bass, 237; Thymus and its, 240; Renal, in rabbit, 274; immunity, 274; growth in animals with spontaneous tumors, 158; Thyroid, of bones, 354; of hypothalamic region of middle brain, 355; Localization of cerebellar, 355; Chemical study of, 378; Roentgen deep therapy in malignant, 391; Free, diagnosis, 399; Management of ovarian, complicating pregnancy, 409; Malignant of right kidney in child, 416; Rare mammary, 452; Primary, of pleura, 452; Mediastinal, treated by radiotherapy, 453; Pathology of large intestine with radical operation for colonic, 553
- Turbinate, Galvanocautery operation for lower, 97
- Twilight sleep, 183
- Twins, Siamese, 415
- Typhoid, Infection of ovarian dermoid cyst with, bacillus, 74
- U**LCERS, Aids in diagnosis of surgical conditions of stomach with especial reference to characteristic X-ray appearance of syphilitic hour-glass in contrast to simple, and cancer, 32; Gastric, following removal of adrenals, 33; of duodenopyloric fornix, 35; of jejunum, 35; Trophic element in origin of gastric, 140; Etiologic relationship existing between gastric, and gastric cancer, 140; Treatment of gastric, 141; Anatomical and physiological subdivisions of duodenum, with pathogenesis of, 142; Cause of gastric, 250; Traumatic gastric, 251; Postoperative treatment of peptic, and cholecystitis, 251; Perforating pyloric and duodenal, 252; Chronic gastric and duodenal, 253; Surgical treatment of gastric and duodenal, 254; Duodenal, with special reference to its X-ray diagnosis, 254; Multiple acute gastric, after using Percy's cold iron for inoperable carcinoma, 365; Roentgenologic diagnosis of duodenal, 366; Chronic, of duodenum, and its gastric repercussion, 366; Perforated, of stomach and duodenum, 550; Excision versus gastro-enterostomy in treatment of gastric, 551
- Ulcus ventriculi, Occult bleeding in, and stomach carcinoma, 364
- Ultraviolet rays, Treatment of nævus flammeus and allied conditions by filtered, employing the compression method of application, 491
- Umbilical hernia, End-Results in, operations, 249
- Undescended, Treatment of, testicle, 422
- Unilateral hæmaturia, 86
- Ununited, Malunited and, fractures, 473
- Urachus, Permeability of, 512
- Ureter, Non-surgical infection of kidneys and, 84; Pharmacology of, action of epinephrin, ergotoxin, and nicotine, 165; Multiple, with hydronephrosis, 189; Supernumerary, 311; Pharmacology of, action of drugs affecting sacral autonomies, 311; Pyelo-ureterography as aid in diagnosis of obscure surgical conditions of kidney and, 608
- Ureteral, Stricture, 87; Diagnosis of, calculus, 419; Giant, calculus; anomalous development of genito-urinary tract, 510; calculi, 607; Diagnosis of renal and, calculi, 608
- Ureterography, Pyelo-, as aid in diagnosis of obscure surgical conditions of kidney and ureter, 608
- Urethra, Double, with operation, 90; Venous autoplasty of traumatized, 191; Primary carcinoma of, retention of urine from obstruction; restoration of function by radium, 421; Congenital stricture of, 421; Traumatic stricture of, by projectile with unexpected trajectory, 513; Injuries of bladder and, in war, 609
- Urethral, Gonorrhoeal infection of, glands, 190; Diagnosis and treatment in obscure, pain, 191
- Urethritis, Chronic, in women diagnosis and treatment in obscure urethral pain, 191
- Uric acid solvent power of urine after administration of piperazine, lysidin, lithium carbonate, and other alkalies, 60
- Urine, Uric acid solvent power of, after administration of piperazine, lysidin, lithium carbonate, and other alkalies, 60; Demonstrating bacteria in, by centrifuge; relative value of examinations by culture or stained sediment, 84; stasis in etiology of pyogenic kidney infections, 84; Hexamethylenamine as urate solvent and diuretic, and its effect on reaction of, 92



- Urinary, Problems in X-ray diagnosis of, calculi, 89; Hexamine as, antiseptic, 189; Diagnosis of genito-, tuberculosis, 192; Seven-glass, test, 418; Herniæ of, bladder, 512; retention due to prostatic obstruction 514; diagnosis of pregnancy, 601
- Urogenital, War injuries of, system, 85; Diagnosis and prognosis of, tuberculosis, 92
- Urticaria and pseudo-appendicitis, 67
- Uterus, Double, in its relation to diagnosis and treatment, 71; Operation for retrodisplacement of, 71; Removal of troublesome useless, 72; Operation for posterior displacement of, 296; Operation in various cases of retrodisplacement of, 402; Rupture of, during labor, 411; Essential hæmorrhage of, 499; Red myoma of, 499; Treatment of backward displacements of, 500; Cancer of, 588; Carcinoma of, treated according to Percy method, 588; Prolapse of, in nulliparous women, 589
- Uterine, Heat as method of treatment in inoperable, carcinoma, 69; Radium treatment of, fibroids, 70; Lower, segment; its origin and boundaries, 79; Prophylaxis of, cancer, 173; Roentgen treatment of, carcinoma, 174; Treatment of puerperal sepsis by, suction and drainage, 305; X-ray treatment of, myomata, 402; Unilateral polypiform oedematous elongation of, cervix, 499; Treatment of, prolapse, 500; Intra-, crying, 508; Etiology of, prolapse and cystocele, 500; New and simple operation for, prolapse, 591
- VACCINE, treatment, 276; treatment of chronic suppurative otitis media, 426; therapy and other treatment in acne vulgaris and furunculosis, 481; treatment in surgical cases, 574
- Vaccination, Result of prophylactic, against tetanus, 382
- Vaginal, hysterectomy for proclitelia, 501; hysterectomy, 501; Nature of bactericidal property of, secretion, 592; Adenomyoma of recto, septum, 594
- Vaginitis, Report of committee on, 403
- Vagitus uterinus, 178
- Vagotomy, Alterations of the endocrine glands, especially the thymus and of blood following, 490
- Valgus, Influence of os calcis on production and correction of, deformities of foot, 265; Autogenous bone-graft pin in treatment of painful flat-foot and paralytic, 266; Hallux, 376
- Varicocele, Vaginal hydrocele operated upon by inguinal route, operated upon by high suspension of testicle, 191; New operation for treatment of, 423
- Varicose veins, Surgical significance and operative treatment of enlarged and, of spinal cord, 281
- Vascular injuries, Auscultation in diagnosis of, accompanying gunshot wounds, 281; Experience with, 381
- Veins, Gunshot arteriovenous aneurism in which the sac was situated on side opposite the, 280; Wounds of, 381
- Venous autoplasty of traumatized urethra, 191
- Vertebra, Dislocation of first cervical, produced by manipulation, 48; Injuries of spinal cord with gunshot injury of cord at fourth cervical, and successful removal of projectile, 377; Extraction of shrapnel bullet from third lumbar, 570; Fracture of lumbar, and transverse processes, 155; Repair of breach of trapezius and splenius with cicatrix adhering to cervical, 374
- Vertebral metastatic carcinoma primary in breast, 376
- Vertex presentation, Late conservative cesarean operation with, for cicatricial atresia of vagina, 504
- Vesical fistula due to permanent foreign body in bladder, 189
- Vesical, Pain in renal and, lesions; its characteristics; anomalies and misleading manifestation, 188; drainage; historical review and presentation of new apparatus, 420
- Vesicoprostatic, Calculi of, region in old prostatics, 423
- Vesiculitis, Seminal, 513
- Vestibular, New method of examining the, labyrinth, 515
- Visceral crises in angioneurotic oedema, 245
- Visceroptosis, 471; Rôle of, in arthritis deformans, 145; Relation of, to spinal lesions, 154; Incidence of, 262
- Vocal cord, Partial excision of thyroid cartilage as an alternative to thyrotomy in malignant disease of, 315
- Volvulus, 457; Gastric, in hour-glass stomach of congenital malformation, 249
- Vomiting, Uncontrollable, of pregnancy, 177; Uncontrollable, of lactation, 602
- W AIVER of privilege, 496
- War, treatment of infected joints in, 42; Injuries of the large bloodvessels in, 57; Functional status of amputation stumps in, 148; Tetanus; a surgical complication in the present, 282; Gas gangrene in present, 289; Organization and problems of, hospital, 293; Cranial wounds in, surgery, 353; Indirect traumatism of lung due to nearby explosion of large, projectiles, 361; Wounds of abdomen by, projectiles, 363; Treatment of fractures of thigh in, surgery, 371; Resections of elbow in, surgery, 374; Surgery in, 392; surgical interventions, 397; Study of pus in, surgery, 493; Gaseous gangrene in, surgery, 493; Cranial wounds by, projectiles at front, 538; Treatment of cranial wounds by, projectiles, 539; End-results of pleuropulmonary wounds, by projectiles, 548; Frozen limbs and their treatment in present, 561; Resection of shoulder in, surgery, 566; Treatment of bladder injuries by, projectiles, 610; Injuries of bladder and urethra in, 610; Results obtained from employing Carrel's method of, surgery, 494
- War fractures, 145; Operative treatment of, 147
- War injuries, of urogenital system, 85; of jaws and face, 130, 350; of larynx and trachea, 360; Considerations on, 493
- War wounds, Aneurisms of, 56; Rules relative to treatment of suppurating, 66; Abdominal, surgery, 137; Treatment of, 168; of nose, nasal fossæ, and accessory cavities, 195; Partial amputation of foot for gunshot, 375; Sterilization of, 493; Secondary union of, by first intention, 494; Researches on secondary suture of, 494; Treatment of septic, by abstention, 583; Results obtained by early and systematic disinfection of, 583; Treatment of infected suppurating, 584; Reduction of disabilities from, 585
- Warfare, wounds of chest in, 27; Operations for cranio-cerebral wounds of modern, 448
- Wassermann, Antagonistic action of negative sera upon, reaction, 276; Routine, reaction in hospital obstetrics, 415; Value of, test in pregnancy, 601
- Wharton's duct, Calculi in submaxillary gland and, 21; Calculus of, 353
- Wounds, Physics of surgical dressing of, with reference to the use of impermeable material over septic wounds, 17; Resection in projectile, of neck, 26; of chest in warfare, 27; Gunshot, of chest, 239; Gunshot, of thorax, 28; Aneurisms of war, 56; Epicrises in, aneurisms, 57; Gunshot, of soft parts, 63; Secondary closing of, 65; Treatment of gunshot, 65; Sodium hypochlorite in treatment of septic, 66; Rules relative to treatment of suppurating, in war, 66; dressings, 127; Gunshot retention, 167; Gunshot, in upper limbs, 167; Treatment of, in war, 168; Ocular, of war, 193; of nose, nasal fossæ, and accessory cavities in time of war, 195; Method of testing antiseptics for, 230; Bacteria of gangrenous, 283; Effects of tethelin in healing of, 286; Principles of treatment and their

- application to, 292; Treatment of septic, with drainage, 292; Painless, rational, and economic treatment of, 292; Simple after-treatment for perineal, 301; Continuous irrigation of, in field, 347; Very extensive shell, of face, 350; Articular gunshot, 363; Splenectomy for, 370; Immediate treatment of articular, in field ambulance, 371; of veins, 381; Treatment of, by method of Carrel, 397; Treatment of gunshot, in bladder, 420; Treatment of gunshot, of testicle, 422; Origin and structure of fibrous tissue formed in, healing, 487; Sterilization of war, 493; Clinical, cytological, and therapeutical study of, of chest in ambulance at front, 542; Process of repair in, of small intestine, 552; Treatment of wounds in civil practice, 577; Dressing of, 583; Treatment of septic war, by abstention, 583; Treatment of infected, by physiological methods, 584; Treatment of infected suppurating war, 584; Reduction of disabilities from, in war, 585; Tetanus-like spasm localized to limb, 289
- Wounds of abdomen, Gunshot, 30; in surgery, 137; Evolution of treatment of, in ambulance at front, 138; and their treatment, 138; Penetrating, 242, 243, 244; Symptoms and complications of gunshot, 246; Treatment of penetrating, in ambulance, 363; by war projectiles, 363
- Wounds of cranium, Gunshot, 20; Gunshot, 232; in war surgery, 353; Grave accidents of late appearance in craniocerebral wounds of war, 354; Craniocerebral and, 354; Operations for, of modern warfare, 448; by war projectiles at front, 234; operations, 538; Treatment of, at front, 539; Treatment of, by war projectiles, 539; Process of cicatrization of open, 541
- Wounds of spine, Gunshot, 270; Treatment of, 271; Gunshot injuries and, cord, 271
- Wounds: See also Military
- Wrist, Splint for drop-, 475; Springs and sprain-fracture of the, -joint, 564
- X**ANTHOCHROMIE, Coagulation massive and, occurring in tuberculosis of cervical spine, 156
- Xenomenia, Compensatory menstruation, memmes devii, 70
- X-ray, Aids in diagnosis of surgical conditions of stomach with especial reference to characteristic, appearance of syphilitic hour-glass in contrast to simple ulcer and cancer, 32; Results of combined mercury-lamp and deep, treatment of human lung tuberculosis, 61; Experimental grounds for treatment of lung tuberculosis by, 61; Results in, treatment of menorrhagia, dysmenorrhœa, and uterine myoma, 71; Problems in, diagnosis of urinary calculi, 89; Removal of intracranial foreign body under, 232; Duodenal ulcer with special reference to its, diagnosis, 254; department of Scottish Women's Hospital, 293; treatment of uterine myomata, 402; Corroborative diagnosis of mastoiditis by means of, 515; localization of foreign bodies in eye by Sweet method, 611
- X-ray: See also Roentgen, Radium



## INDEX OF BIBLIOGRAPHY

### GENERAL SURGERY

#### *Surgical Technique*

- Operative Surgery and Technique, 100, 198, 316, 432, 518, 615
- Aseptic and Antiseptic Surgery, 100, 198, 316, 432, 518, 615
- Anæsthetics, 100, 198, 316, 432, 518, 615
  - General. Local. General subjects on anæsthetics
- Surgical Instruments and Apparatus, 100, 198, 316, 432, 518, 615

#### *Surgery of the Head and Neck*

- Head, 101, 198, 317, 433, 519, 615
- Scalp. Skin. Nerves. Glands. Skull and Maxilla. Meninges. Brain, cerebrum, cerebellum, hypophysis
- Neck, 102, 200, 318, 434, 519, 616
  - Skin. Glands. Muscles and blood-vessels.
  - Bones. Thyroid: Goiter, Basedow's disease, Graves' disease. Parathyroid. Retropharyngeal conditions

#### *Surgery of the Chest*

- Chest Wall and Breast, 102, 200, 318, 434, 520, 617
  - Breast. Incisions, wounds, injuries, etc. Bones, Pleura. Mediastinum. Thymus
- Trachea and Lungs, 102, 201, 318, 434, 520, 617
  - Trachea. Bronchi. Lungs
- Heart and Vascular System, 102, 201, 318, 434, 520, 617
  - Heart. Pericardium. Aorta
- Pharynx and Oesophagus, 103, 319, 435, 520, 617

#### *Surgery of the Abdomen*

- Abdominal Wall and Peritoneum, 103, 201, 319, 435, 520, 618
  - Incisions and drainage. Tumors. Retro- and pro-peritoneal conditions. Peritoneum. Diaphragm. Hernia. Omentum. Mesentery. Ura-chus. Diverticula
- Gastro-Intestinal Tract, 103, 202, 319, 435, 521, 618
  - Stomach and pylorus. Duodenum: Small intestines. Cæcum. Appendix. Colon. Rectum
  - Anus
    - Secretions of, diagnosis, radiology, injuries, hæmorrhages, vomiting, inflammations, obstructions, hernia, ulcer, tumor, surgery, general therapy
- Liver, Pancreas, and Spleen, 104, 203, 320, 437, 522, 619
- Miscellaneous, 105, 203, 321, 437, 523, 619

#### *Surgery of the Extremities*

- Diseases of Bones, Joints, Muscles, Tendons. General Conditions Commonly Found in the Extremities, 105, 203, 321, 437, 523, 620

- Fractures and Dislocations, 105, 204, 321, 438, 523, 620
- Surgery of the Bones, Joints, etc., 106, 204, 322, 438, 524, 621
- Orthopedics in general, 106, 205, 322, 439, 524, 621

#### *Surgery of the Spinal Column and Cord*

- Diseases and Deformities of the Spine, 107, 205, 323, 439, 525, 621
- Inflammations, tumors, fractures, surgery. Cord

#### *Surgery of the Nervous System*

- Nervous System, 107, 206, 323, 440, 525, 622
- Inflammations, tumors, surgery

#### *Miscellaneous*

- Clinical Entities — Tumors, Ulcers, Abscesses, etc., 107, 206, 323, 440, 525, 622
- Tumors. Ulcers, Inflammations. Shock. Tissue transplantation. Surgical diseases
- Sera, Vaccines and Ferments, 108, 206, 324, 440, 526, 622
- Serum. Vaccine. Ferments. Immunization
- Anaphylaxis
- Blood, 108, 207, 324, 440, 526, 623
  - Blood picture in general. Hæmorrhage. Coagulation. Thrombosis. Embolism. Transfusion
- Blood and Lymph Vessels, 207, 324, 441, 526, 623
  - Aneurisms. Vessel suture and ligation. Lymph-vessels and glands
- Poisons, 108, 207, 324, 441, 526, 623
  - Bacterial. Chemical.
- Surgical Therapeutics, 109, 207, 325, 441, 526, 623
- Surgical Anatomy, 109, 207, 325, 441, 527, 623
- Radiology, 109, 208, 325, 442, 527, 624
  - X-ray. Electrical treatment and injuries. Heliotherapy
- Military Surgery, 110, 208, 326, 442, 527, 624
- Surgical Pathology, 110, 209, 327, 443, 527
- Industrial Surgery, 528, 625
- Hospital, Medicolegal, and Medical Education, 111, 209, 327, 443, 528, 625

### GYNECOLOGY

- Uterus, 111, 210, 327, 444, 529, 625
  - Tumors. Hæmorrhage. Inflammations. Malformations. Displacements. Injuries. Surgery
- Adnexal and Periuterine Conditions, 111, 210, 328, 444, 529, 626
- Ovaries. Tubes. Ligaments. Pelvic conditions in general
- External Genitalia, 112, 211, 328, 444, 529, 626
  - Vagina. Vulva. Urethra. Clitoris
- Miscellaneous, 112, 211, 328, 444, 530, 626

## OBSTETRICS

Pregnancy and Its Complications, 112, 211, 328, 444, 530, 626  
 Pregnancy. Eclampsia and toxæmias. Cæsa-  
 rean section. Abortion. Complications  
 Labor and Its Complications, 113, 212, 329, 445, 531, 627  
 Contracted pelves. Abnormal presentations.  
 Dystocia. Hæmorrhage. Surgical treatment  
 Puerperium and Its Complications, 113, 212, 329, 445, 531, 627  
 Diseases common to. Infections. Hæmorrhages  
 Miscellaneous, 113, 212, 329, 445, 531, 627

## GENITO-URINARY SURGERY

Adrenal, Kidney, and Ureter, 114, 213, 330, 446, 531, 628  
 Adrenal gland. Kidneys. Ureters  
 Trauma, calculi, displacement, malformation,  
 hæmorrhage, tumors, inflammations, surgery,  
 functional tests of

Bladder, Urethra, Penis, 114, 213, 330, 446, 532, 628  
 Trauma, calculi, displacement, malformation,  
 hæmorrhage, tumors, inflammations, surgery  
 Genital Organs, 114, 213, 330, 447, 532, 628  
 Testicle. Epididymis. Spermatic cord. Pros-  
 tate  
 Miscellaneous, 115, 214, 331, 447, 532, 628

## SURGERY OF THE EYE AND EAR

Eye, 115, 214, 331, 447, 532, 629  
 Glaucoma. Trachoma. Cataract. Inflammations  
 Ear, 115, 215, 332, 447, 533, 629  
 Outer ear. Middle ear. Internal ear. Mas-  
 toids. Brain abscess of otitic origin, etc.

## SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose, Throat, and Mouth (oral surgery) 116, 216, 332, 448, 533, 629  
 Nose: external, internal  
 Throat: tonsils, adenoids, larynx, pharynx  
 Mouth: palate, cleft palate, teeth, tongue  
 General conditions



# INDEX OF AUTHORS

- Abadie, J., 244  
 Abbott, A. W., 457  
 Abelio, G., 74  
 Abell, I., 510  
 Abercrombie, R. G., 58  
 Abernethy, E. A., 179  
 Acuna, M., 602  
 Adair, F. L., 304  
 Adams, E., 430  
 Adler, I., 488  
 Aikins, W. H. B., 19  
 Albee, F. H., 44  
 Alberti, O., 388  
 Allan, A. P., 51  
 Allen, H. E., 147  
 Amberg, E., 234  
 Anderson, W. L., 479  
 Andresen, A. F. R., 139,  
 141, 549  
 Andries, J. H., 258  
 Apert, E., 67  
 Arana, G. D., 346  
 Arboleda, A., 193  
 Arcelin, 452  
 Arganaraz, R., 312  
 Armitage, G. L., Jr., 374  
 Armitage, H. M., 374  
 Armour, D., 270  
 Arnaud, L., 539  
 Arnold, J. O., 407  
 Arrowsmith, H., 428  
 Arteaga, I. F., 413  
 Ascoli, 453  
 Ashcraft, L. T., 607  
 Ashhurst, A. P. C., 39  
 Auer, J., 386, 489  
 Austin, J. H., 560  
 Auvray, 570  
 Auwerda, J. C. M., 617  
 Axtell, W. H., 463  
  
 Bacmeister, A., 61  
 Baetjer, F. H., 154  
 Baitsell, G. A., 487  
 Baldwin, C. H., 147  
 Baldwin, J. F., 536  
 Baldwin, M., 350  
 Baldy, J. M., 184  
 Balfour, D. C., 557, 588  
 Bancroft, F. W., 588  
 Bandler, S. W., 303  
 Barbacci, O., 249  
 Barclay, A. E., 228  
 Barling, G., 58  
 Barnert, C., 81  
 Barnes, F. M., Jr., 302  
 Barnes, F. M., 280  
 Barnes, J. H., 194  
 Barnes, R. H., 466  
 Barnhill, J. F., 449  
 Barr, R. A., 551  
 Barron, M., 540  
 Bartels, L., 19  
 Bartlett, W., 347, 349  
 Bates, H. J., 17, 509  
 Bates, H. T., 243  
 Bauman, G. I., 269  
 Baumeister, L., 61  
 Bayne-Jones, S., 32  
 Bazy, 381  
 Bazy, L., 610  
 Bazy, M., 37  
 Beach, R. M., 409  
 Beach, W. M., 455  
 Beatti, M., 378  
 Beck, E. G., 288, 514, 545  
 Beckman, E. H., 537  
 Beer, E., 195  
 Begouin, 357, 380  
 Behan, R. J., 549  
 Bell, A. J., 357  
 Bell, E. T., 274  
 Bell, F. M., 261  
 Bell, R. G., 79  
 Bello, A., 404  
 Belot, 475  
 Bérard, L., 66  
 Berens, T. P., 614  
 Bergeron, J. Z., 20  
 Berial, L., 541  
 Bernhard, A., 483  
 Bernheim, B. M., 281  
 Bernstein, E. P., 483  
 Berry, H. M., 428  
 Berry, J. M., 40  
 Bichat, 453  
 Binet, L., 361  
 Binnie, J. F., 400  
 Birtch, F. W., 399, 483  
 Bissell, D., 510  
 Black, C. E., 347  
 Black, D., 234  
 Blackburn, W. J., 97  
 Blackwell, H. B., 612  
 Block, E. B., 176  
 Block, F. B., 301  
 Boas, 364  
 Boero, E. A., 504  
 Boehme, G. F., Jr., 145  
 Boggs, R. H., 389  
 Boldt, H. J., 173  
 Bolling, R. W., 41  
 Bolognese, G., 487  
 Bonnet, P., 570  
 Boorstein, S. W., 569  
 Boothby, W. M., 28  
 Bourgeois, H., 425  
 Boyd, G. M., 407  
 Bradford, W. H., 253  
 Brancati, R., 165  
 Brandt, K., 575  
 Braun, A., 619  
 Brian, B., 154  
 Bristol, L. D., 399  
 Bromer, R. S., 156  
 Brown, A., 604  
 Brown, C. P., 476  
 Brown, E. D., 285  
 Brown, T. H., 373  
 Brown, W. L., 476  
 Browning, C. H., 577  
 Browning, W., 448  
 Bruns, P. von, 168  
 Bryan, C. W. G., 268  
 Bryan, R. C., 35  
 Bubb, C. H., 21  
 Bucholz, C. H., 272  
 Bulkley, L. D., 571  
 Bull, C. G., 579  
 Bulrich, R. A., 576  
 Buquet, A., 177  
 Burckhardt, H., 42  
 Burge, E. L., 250  
 Burge, W. E., 250  
 Burk, 359  
 Burnham, A. C., 535, 564  
 Burns, J. E., 492  
 Burnett, T. C., 385  
 Burrows, E. C., 261  
 Burrows, W. F., 261  
 Butler, E. E., 578  
 Byford, H. T., 50  
 Bythell, W. J. S., 166  
  
 Calkins, G. N., 273  
 Callison, J. G., 96  
 Cameron, D. F., 419  
 Cameron, H. C., 472, 561  
 Cameron, M. H. V., 185  
 Campbell, W. C., 265  
 Campbell, W. F., 473  
 Camus, J., 291  
 Canuyt, G., 195, 360  
 Carderelli, A., 155  
 Carman, R. D., 241, 366  
 Carmody, T. E., 619  
 Carr, A. M., 270  
 Carr, W. P., 474  
 Carrel, 65  
 Carstens, J. H., 593  
 Carter, W. S., 379  
 Carvalho, C., 296  
 Case, J. T., 34, 62, 174, 370  
 Cassimatis, 193  
 Castex, M., 356  
 Castex, M. R., 376  
 Cates, B. B., 47  
 Cathcart, C. W., 228  
 Celler, H. L., 486  
 Chambers, J. S., 161  
 Chamorro, T. A., 603  
 Chaput, 44, 364  
 Chatillon, F., 455  
 Cherry, T. H., 56  
 Chevassu, M., 138  
 Chiaje, S. delle, 499  
 Chislett, H., 255  
 Churchman, J. W., 192  
 Cifuentes, P., 512  
 Clark, J. P., 613  
 Clark, S. M. D., 498  
 Clark, W. L., 491  
 Claude, H., 47  
 Clendening, L., 362, 454  
 Clermont, 397  
 Clevenger, W. F., 613  
 Coakley, C. G., 516  
 Coates, G. M., 426  
 Coates, L. H., 368  
 Coburn, R. C., 128  
 Coffey, R. C., 77  
 Cogswell, J. W., 178  
 Cohn, I., 127, 265  
 Cole, P. P., 21  
 Collier, J., 271  
 Collin, I., 367  
 Collins, A. S. A. W., 71  
 Collins, C. U., 37  
 Commiskey, L. J. J., 415  
 Condit, W. H., 70  
 Connell, F. G., 552  
 Cook, F. S., 21  
 Cooke, J. V., 456  
 Cope, V. Z., 235  
 Coplin, W. M. L., 248  
 Corner, E. M., 46  
 Cosmettatos, G. F., 355  
 Costa, N. P., 408  
 Costa, R., 407  
 Costa, S., 356  
 Cotte, G., 539, 566  
 Cotton, F. J., 372  
 Crabtree, E. G., 84  
 Crane, C. B., 611  
 Crispin, E. L., 245  
 Crosby, L. G., 491  
 Cross, C., 376  
 Crossen, H. S., 402  
 Crowell, A. J., 514  
 Cullen, T. S., 594  
 Cumming, J. G., 161  
 Cunningham, S. P., 472  
 Cushing, H., 448  
 Cutler, E. C., 400  
 Cutler, F. J., 398  
  
 Dabney, V., 97  
 Dalton, F. J. A., 66  
 Dambrin, C., 377  
 Danforth, W. C., 409  
 Danziger, F., 85  
 Darling, B. C., 316  
 Darnall, W. E., 593  
 Darrach, W., 373  
 DaSilva, R., 177  
 Davidson, A. J., 40  
 Davis, B. F., 129, 367  
 Davis, C. H., 300  
 Davis, D., 161  
 Davis, E. G., 420  
 Davis, E. P., 82  
 Davis, G. G., 477

- Davis, J. D. S., 470  
 Dayton, A. B., 365  
 Dean, H. R., 283  
 Dean, L. W., 427  
 Deaver, J. B., 35, 261, 467  
 Decherd, H. B., 516  
 Decref, 509  
 Dehelly, 65, 493  
 Dehogues, T. L., 94  
 Delagenière, H., 476  
 Delavan, D. B., 581  
 DeLee, J. B., 185, 413, 509  
 Della Torre, P., 142  
 Della Valle, L., 277  
 Delore, X., 539  
 Delorme, E., 167  
 Deluca, F. A., 499  
 Del Valle, D., 423  
 Dench, E. B., 94, 95  
 Denéchau, 548  
 Denny, G. P., 161  
 DePage, A., 370  
 Dermer, 583  
 Derr, J. S., 611  
 Descomps, P., 388  
 Desplas, B., 494  
 DeTarnowsky, G., 159  
 DeVilla, S., 416  
 Dewey, K., 485  
 Dewis, J. W., 32  
 Diehl, H. E., 78  
 Diena, G., 286  
 Diesing, 397  
 Dodge, G. E., 143  
 Dolley, D. H., 578  
 Don, A., 447  
 Donald, A., 598  
 Downes, W. A., 34  
 Dreesman, 550  
 Druceck, C. J., 465, 554, 555  
 DuBose, F. G., 257  
 Dubois, E. F., 485  
 Duclos, 313  
 Dumas, 65, 493  
 Duncan, J. W., 183  
 Dunham, K., 135  
 Dunlop, J., 41  
 Dupont, 567  
 Dupuy, H., 431  
 Durante, L., 98, 140, 358  
 Duval, P., 131, 170, 548  
 Dyas, F. G., 162  
 Eccles, W. M., 56  
 Edgar, J. C., 179, 184  
 Edinger, L., 49  
 Edwards, F. W., 260  
 Eggleston, C., 578  
 Eggstein, A. A., 238, 262  
 Ehrenfest, H., 74  
 Eikenbary, C. F., 263  
 Einhorn, M., 38, 466  
 Eisen, E. J., 315  
 Elliott, G. R., 569  
 Elliott, T. R., 251  
 Elmer, W. G., 480  
 Elsborg, C. A., 281, 569  
 Ely, A. H., 597  
 Emery, W. D., 230, 383  
 Enderlen, 495  
 Erkes, F., 421  
 Ernst, N. P., 365, 582  
 Ersner, M. S., 426  
 Escalada, C., 431  
 Estes, W. L., 564  
 Evans, D. J., 78  
 Evans, F. A., 160  
 Evans, J. S., 26  
 Eve, F., 350  
 Everidge, J., 282  
 Ewing, J., 60, 240  
 Falco, A., 184  
 Falls, F. H., 506, 601  
 Farani, A., 176, 178  
 Farrington, P. M., 430  
 Faure-Beaulieu, 354  
 Ferguson, L. M., 31  
 Fernandez, J., 312  
 Ferreyra, F., 411  
 Field, J. A., 605  
 Fiessinger, 493  
 Fieux, G., 40  
 Filhoulard, 475  
 Findley, P., 589, 596  
 Finochietto, R., 248  
 Fiolle, J., 495  
 Fiolle, P., 495  
 Fisher, H. R., 17  
 Fitz, R., 385  
 Fitzgibbon, G., 500  
 Fleisher, M. S., 158  
 Flesch, M., 167  
 Flint, J. M., 293, 474  
 Flumerfelt, G., 142  
 Foley, S., 602  
 Fonyo, J., 304  
 Forselius, C., 574  
 Forsell, G., 581  
 Foulkrod, C., 179  
 Fourmestiaux, 566  
 Fowler, H. A., 187, 608  
 Fowler, R. H., 458  
 Fox, H. H., 481  
 Francis, L. M., 81  
 Fraser, A., 416  
 Fraser, J., 17, 243, 256, 551  
 Frazier, C. H., 23, 462  
 Freeland, J. R., 507  
 Freeman, L., 58  
 Frieberg, A. H., 45  
 French, T. R., 429  
 Freund, H., 89, 493  
 Friedberg, S. A., 98  
 Friedenwald, J., 34  
 Friedlander, A., 607  
 Friedman, J. C., 249  
 Friedmann, M., 379  
 Fuller, E. B., 280  
 Fullerton, A., 609  
 Fullerton, W. D., 603  
 Gaarde, F. W., 417  
 Gallant, A. E., 72  
 Gallie, W. E., 373  
 Gallo, N., 378  
 Gandino, N. T. F. de, 508  
 Gasbarrini, A., 249  
 Gates, F. L., 387, 489  
 Gatewood, 240  
 Gatewood, W. E., 96  
 Gaucher, 67  
 Gaudiani, V., 545  
 Gauss, H., 576  
 Gaut, S. G., 465  
 Gaylord, H. R., 237  
 Geist, G. A., 356  
 Geist, S. H., 589  
 Gellhaus, 52  
 Gellhorn, G., 74  
 Gentili, A., 306  
 Georg, C., Jr., 136  
 Gerber, I., 390  
 Gewin, W. C., 188  
 Gibbon, J. H., 422  
 Gibson, F. S., 284  
 Gibson, J. H., 422  
 Giffin, H. Z., 557  
 Gilbreth, F. B., 586  
 Gillette, W. J., 572  
 Gilpatrick, R. H., 417  
 Gittings, J. C., 403  
 Gley, 446  
 Goadby, K., 381  
 Goetsch, E., 131, 450  
 Goldsborough, F. C., 596  
 Good, R. H., 313  
 Goodman, C., 483  
 Goodwin, R. T., 69  
 Gordon, G. S., 514  
 Gordon, W., 585  
 Gosset, A., 22, 49  
 Goullioud, 452  
 Grad, H., 410  
 Graf, P., 381  
 Granger, A., 511  
 Grant, W. W., 228  
 Graves, J. C., Jr., 480  
 Graves, S., 454  
 Graves, W. P., 590  
 Gray, H. M. W., 20  
 Green, N. W., 360  
 Greenough, R. B., 63  
 Greig, D. M., 472  
 Grey, E. G., 24, 355  
 Gronnerud, P., 238  
 Grossi, V., 86  
 Grossman, J., 564  
 Groves, E. W. H., 373  
 Groves, H., 565  
 Guibé, 353  
 Gundelfinger, 85  
 Guthrie, D., 368  
 Guttman, J., 453, 612  
 Haberland, H. F. O., 57  
 Hagedorn, O., 391  
 Haines, W. D., 255  
 Haller, 563  
 Hamill, S. M., 403  
 Hammes, 61  
 Hammond, R., 155, 569  
 Handfield-Jones, M., 71  
 Handley, W. S., 248  
 Hanes, G., 19  
 Hanes, G. S., 464  
 Hanford, C. W., 62  
 Hannah, C. R., 82  
 Hanzlik, P. J., 92  
 Harada, T., 592  
 Hardouin, P., 273, 374  
 Harrar, J. A., 505  
 Harris, J., 596  
 Harrison, F. C., 475  
 Harrower, H. R., 573  
 Hartmann, H., 354  
 Haskins, H. D., 60  
 Hassin, G. B., 270  
 Hatch, E. S., 480  
 Hatcher, R. A., 578  
 Hawk, P. B., 502  
 Hawley, D. C., 463  
 Hawley, G. W., 264  
 Hayes, G. B., 350  
 Hays, H., 98, 515  
 Hazen, H. H., 481  
 Healy, W. P., 406  
 Hedblom, C. A., 414  
 Heineberg, A., 403, 503  
 Heineck, W. J., 512  
 Hektoen, L., 276  
 Held, T. W., 453  
 Henderson, F. F., 372  
 Henderson, M. S., 154, 263, 264, 477, 568  
 Henderson, Y., 537  
 Hendrix, B. M., 458  
 Henes, E., Jr., 556  
 Henessy, J. T., 195  
 Henrici, A. T., 274  
 Henry, H., 251  
 Herbst, R. H., 192  
 Hering, H. E., von, 349  
 Hernaman-Johnson, F., 287  
 Herrick, J. F., 29  
 Hess, A. F., 53  
 Heyerdahl, P. A., 580  
 Higgins, H. L., 385  
 Hill, I., 600  
 Hill, T. C., 466  
 Hingston, C. A. F., 183  
 Hingston, D., 564  
 Hirsch, I. S., 242, 491  
 Hitzrot, J. M., 41  
 Hoeve, H. J., 259  
 Hoffman, P., 43  
 Hofmann, E., 517  
 Holbrooke, C., 183  
 Holding, A. F., 133, 391  
 Holland, 135  
 Holmes, G. W., 167  
 Holmes, J. B., 469  
 Horrax, G., 284  
 Horsley, J. S., 163, 517  
 Horwitz, A. E., 145  
 Hoskins, R. G., 159, 284  
 Hoxie, G. H., 135  
 Hubeny, M. J., 256  
 Hudson-Makuen, G., 195  
 Huertas, J., 138  
 Huggins, R. R., 459  
 Huguenin, M., 312  
 Hull, A. J., 271, 392  
 Hunner, G. L., 87  
 Huntington, T. W., 146  
 Hussey, A. A., 406, 598  
 Huxley, F. M., 305  
 Hymanson, A., 508  
 Ireata, D., 307, 411  
 Irving, F. C., 80



- Isnardi, L., 292, 583  
 Ivy, R. H., 315  
 Iyer, H. N., 415  
 Jablons, B., 144  
 Jackson, C., 547  
 Jackson, D. E., 18  
 Jackson, H., 233  
 Jacob, F. M., 24  
 Jacobs, C. M., 568  
 Jaugeas, F., 453  
 Jefferson, G., 35, 142  
 Jennings, J. E., 358  
 Jobling, J. W., 238, 262  
 Jocsq, 312  
 John, R. L., 570  
 Johnson, C. C., 232  
 Johnson, J. E., 256  
 Johnstone, K. L., 270  
 Jonas, A. F., 48  
 Jones, E. O., 536  
 Jones, F. S., 384  
 Jones, R., 270, 375, 473, 479, 568  
 Judd, E. S., 57, 468  
 Kahn, A., 161  
 Kahn, M., 508  
 Kakels, M. S., 85  
 Kane, E. O., 43, 127  
 Kanoky, J. P., 354  
 Kantor, J. L., 262  
 Kasahara, M., 604  
 Kazanjian, V. H., 21  
 Keefe, J. W., 535  
 Kellogg, F. B., 98  
 Kellogg, J. H., 296  
 Kelly, H. A., 89, 166  
 Kelly, M. F., 268  
 Kendall, E. C., 134  
 Kennedy, J. W., 169, 175  
 Kenny, T. B., 557  
 Kenyon, E. L., 430  
 Keogh, A. H., 392  
 Keschner, M., 449  
 Keys-Wells, E. N., 492  
 Kidner, F. C., 561  
 Kilgore, A. R., 456  
 Kleinberg, S., 270  
 Kleiner, I. S., 277  
 Klotz, O., 575  
 Knapp, A., 611  
 Knott, V. B., 551  
 Koch, W. F., 26  
 Kohlmann, W., 305  
 Kradwell, W. T., 430  
 Krause, H. A., 506  
 Kretschmer, H. L., 417  
 Krida, A., 278  
 Krieg, A., 416  
 Kroenig, B., 231  
 Krouse, L. J., 464  
 Kuegle, F. H., 286  
 Kuemmell, 382  
 Kuepferle, 61  
 Kuettner, H., 57  
 Kutz, D. B., 613  
 Kyle, J. J., 516  
 Lack, H. L., 316  
 Lambert, R. A., 273  
 Lanbrethsen, J., 452  
 Lancer, T. F., 245  
 Landa, G. M., 195  
 Landivar, A. F., 541  
 Landois, F., 42  
 Landry, L. H., 22  
 Landsman, A. A., 259  
 Lane, A., 147  
 Lange, S., 71  
 Langrock, E. G., 56  
 Lanier, L. H., 314  
 Lansdown, R. G. P., 289  
 Laroque, G. P., 296  
 Latarjet, A., 398, 538  
 Learmonth, M. E., 451  
 Leavitt, M. A., 349  
 LeBreton, P., 156  
 Lee, J. R., 232  
 Lefort, A., 190  
 Leggs, A. T., 375  
 Légueu, F., 191, 419  
 Leigh, S., 462  
 Lemon, C. H., 146  
 Lenormant, C., 359  
 Lent, E. J., 515  
 Leonard, V. N., 365  
 Leopold, J. S., 483  
 Leopold, S., 354  
 Leriche, 26  
 Lérique, R., 361, 398, 540  
 Leroy, 583  
 Levy, 422  
 Levy, I. H., 262  
 LeWald, L. T., 360  
 Lewin, P., 544  
 Lewis, B., 19  
 Lewis, D., 267, 388  
 Lewisohn, R., 142  
 L'Hermitte, J., 47  
 Lieb, C. C., 552  
 Lilienthal, H., 544, 546  
 Linberger, 374  
 Lind, J. E., 592  
 Lindeman, E., 55, 597  
 Lindsay, J. A., 551  
 Little, E. G., 238  
 Livierato, 355  
 Llewellyn, T. H., 301  
 Locher, R. W., 171  
 Loeb, L., 158  
 Long, J. W., 403  
 Loop, R. G., 606  
 Lord, J. P., 265  
 Losee, J. R., 269  
 Lott, H. S., 590  
 Loughran, R. L., 612  
 Loumeau, 421, 423, 424, 513  
 Lounsberry, B. F., 372  
 Lovett, R. W., 46  
 Lubman, M., 194  
 Luc, H., 545  
 Ludlum, S. D. W., 481  
 Lumière, A., 66  
 Lund, F. B., 556  
 Lydston, G. F., 424  
 Lyle, H. H. M., 476  
 MacCarty, W. C., 358, 451  
 Maccabruni, F., 541  
 MacConkey, A. T., 282  
 Macedo, C., 86, 186  
 Macht, D. I., 165, 311  
 MacDonald, I., 252  
 MacKay, W. A., 252  
 MacKenzie, D. W., 90  
 MacLennan, A., 229  
 MacNider, W. D., 128  
 MacWhinnie, A. M., 516  
 Mahn, G., 231  
 Makins, G. H., 246, 281  
 Manges, M., 196  
 Mangini, L., 193  
 Mann, F. C., 33  
 Mann, G., 265  
 Mapes, C. C., 37  
 Marchak, 567  
 Marriott, W. M., 482  
 Marsh, M. C., 237  
 Marshall, H. W., 156, 472  
 Martini, T., 366  
 Marvel, E., 585  
 Masserini, 453  
 Massey, G. B., 158  
 Mathews, F. S., 21  
 Maurel, 348  
 May, A. H., 596  
 Mayer, E., 517  
 Mayes, W. C., 517  
 Maylard, A. E., 191  
 Mayo, W. J., 36, 38, 553, 558  
 McArdle, J. S., 463  
 McCann, F. J., 500  
 McCarthy, J. F., 92  
 McCarty, F. B., 129  
 McConnell, A. A., 63  
 McCouch, G. P., 481  
 McCrae, T., 248  
 McGlannan, A., 41  
 McGlinn, J. A., 301, 598  
 McGuire, S., 59  
 McKenzie, B. E., 153  
 McLean, A., 54  
 McLean, E. H., 59  
 McNeile, L. G., 600  
 McNeile, O., 347  
 McWhorter, J. E., 552  
 McWilliams, C. A., 44  
 Means, J. H., 573  
 Meisenbach, R. O., 269  
 Meltzer, S. J., 386, 387  
 Mensing, E. H., 451  
 Menzies, J. L., 239  
 Merritt, A. H., 431  
 Mertz, H. O., 311  
 Metcalfe, J., 492  
 Meyer, W., 53  
 Middleton, W. S., 26  
 Miller, G. I., 379  
 Miller, R. B., 293  
 Mills, R. W., 254  
 Millwee, R. H., 288  
 Minot, G. R., 161, 276, 279  
 Mitchell, A. G., 306  
 Mitchell, W. C., 574  
 Mitchell, W. T., Jr., 144  
 Mocquot, P., 129, 363  
 Moeller, O., 502  
 Moiroud, 493  
 Molina-de Saint Remy, A. H., 96  
 Moncalvi, L., 162  
 Monsaingeon, 49  
 Montanari, E., 405  
 Montgomery, E. E., 303  
 Moore, A. B., 241  
 Moore, I., 242  
 Moore, J. E., 74, 473  
 Moore, J. J., 601  
 Moots, G. W., 574  
 Morestin, H., 22, 350  
 Morgan, E. A., 252  
 Morgan, J. D., 448  
 Moriarta, D. C., 490  
 Morison, R., 584  
 Morley, A. S., 260  
 Mornard, P., 542  
 Morris, R. T., 256, 573  
 Morriss, W. H., 52  
 Morton, C. A., 280  
 Morton, D. J., 569  
 Morton, H. H., 423  
 Moschowitz, E., 73, 459  
 Mott, F. W., 63  
 Mouat, T. B., 283  
 Mouchet, A., 374  
 Moulinier, R., 380  
 Moullin, C. M., 51  
 Moure, E. I., 515  
 Moynihan, B., 65  
 Mullally, G. T., 289  
 Mundell, J. J., 81  
 Myers, H. E., 619  
 Nakano, H., 169  
 Nathan, P. W., 474  
 Nealon, W. A., 549  
 Neill, W., 89  
 Neuhoef, H., 197  
 Neuhoef, S., 280  
 Newbolt, G. P., 239  
 Newcomet, W. S., 390  
 Newell, C. H., 591  
 Newman, D., 188, 308  
 Nicholson, R. L., 411  
 Nicolaysen, J., 575  
 Nimier, 493  
 Nix, J. T., Jr., 565  
 Norris, C. C., 409  
 Ober, F. R., 375  
 O'Brien, F. W., 262  
 Olivella, R., 413  
 Openshaw, T. H., 152  
 O'Reilly, A., 46  
 Orr, H. W., 478  
 O'Shansky, A. L., 74  
 Outland, J. H., 362, 454  
 Packard, F. R., 94, 548  
 Packard, R. G., 153  
 Page, H. M., 446  
 Painter, C. F., 55, 269, 376  
 Pallasse, E., 452  
 Palmer, C. L., 33  
 Pardo, S. Y., 196  
 Parker, D. B., 196  
 Pascal, A., 500  
 Pauchet, V., 365

- Payne, J. L., 130, 350  
 Payne, R. L., Jr., 510  
 Peabody, F. W., 385  
 Peacock, A. H., 189  
 Peak, J. H., 471  
 Peck, G. A., 450  
 Peckham, F. E., 147, 155  
 Pedersen, V. C., 418, 419  
 Peet, M. M., 458, 462  
 Pellegrini, E., 386, 387  
 Pemberton, F. A., 590  
 Pembrey, M. S., 446  
 Pepper, O. H. P., 560  
 Percy, J. F., 69  
 Perkins, C. W., 287  
 Perreau, H., 27  
 Perret, M., 494  
 Perrier, C., 424  
 Perry, R. St. J., 232  
 Perussia, F., 370  
 Peterkin, G. S., 423  
 Petersen, W., 238, 262  
 Peterson, E. W., 279  
 Peuret, A., 371  
 Pfeiffer, D. B., 363  
 Pfender, C. A., 174  
 Pfister, F., 194  
 Phelan, G. W., 183  
 Phocas, 191  
 Picqué, R., 138, 371, 542, 561  
 Piéry, 547  
 Pighini, G., 490  
 Pilcher, E. M., 392  
 Plaggemeyer, H. W., 91  
 Plass, E. D., 183  
 Plummer, W. W., 132  
 Polak, J. O., 179  
 Policard, A., 494  
 Pope, S., 32  
 Porritt, N., 305  
 Porter, M. F., 577  
 Posados, I. N., 189  
 Posey, W. C., 313  
 Powell, C., 574  
 Power, D., 457  
 Pozzi, E., 189  
 Pozzi, S., 371  
 Preston, M. E., 147  
 Priani, P., 449  
 Prime, F., Jr., 62  
 Primrose, A., 17  
 Proust, R., 177, 493  
  
 Quain, E. P., 512  
 Quarella, B., 364  
 Quénu, E., 131, 348, 362, 375  
 Quigley, D. T., 63  
 Quillian, G. W., 275  
 Quinby, W. C., 175, 188  
 Quinlan, F. J., 314  
 Quiros, D., 606  
 Quiserne, 291  
  
 Raab, F. H., 79  
 Rabinovitz, M., 592  
 Randall, A., 422  
 Ransohoff, J., 70, 86  
 Ransohoff, J. L., 70  
  
 Rauch, R., 193  
 Razetti, L., 67  
 Raymond, H., 422  
 Read, J. S., 426  
 Reder, F., 601  
 Reder, G. J., 133  
 Regnault, I., 307  
 Remy, C. E., 472  
 Remsen, C. M., 23  
 Reyn, A., 572  
 Reynolds, G. E., 130  
 Rhodes, G. B., 425  
 Ribas, G., 599  
 Rich, E. A., 475  
 Richards, O., 551  
 Richardson, M. L., 39  
 Rico, I., 353  
 Ridlon, J., 475  
 Riggles, J. L., 592  
 Riggs, T. F., 371  
 Rist, 135  
 Ritter, 384  
 Roberts, J. B., 41, 51  
 Roberts, P. W., 265, 268  
 Robertson, H. E., 282, 383  
 Robertson, T. B., 286, 385  
 Robinson, E. F., 372  
 Robinson, J. E., 461  
 Robinson, S., 240, 543  
 Rochet, 421  
 Rodenbaugh, F. H., 456  
 Roffo, A., 378, 541  
 Rogers, A., 128  
 Rogers, M. H., 49, 478  
 Rogoff, J. M., 284  
 Rollet, E., 193  
 Roost, F., 617  
 Rosenow, E. C., 300  
 Rosenzweig, S. B., 264  
 Roubier, C., 452  
 Rouhier, 363  
 Rous, P., 52, 56, 384  
 Rouvillois, H., 137  
 Rowen, J. J., Jr., 160  
 Rowlands, R. P., 283, 554  
 Roy, D., 618  
 Royce, C. E., 234, 542  
 Royster, H. A., 158  
 Rugh, J. T., 47  
 Rumbaugh, M. C., 599  
 Ryerson, E. W., 45, 479  
  
 Saint, C. F. M., 292  
 Salatch, P. B., 174  
 Saliba, J., 248  
 Salisbury, W., 305, 599  
 Salvador, J., 301  
 Sampson, H. H., 242  
 Saphir, J. F., 259  
 Savill, A., 293  
 Saviozzi, V., 420  
 Sayre, R. H., 271  
 Schachner, A., 377  
 Scheult, R., 596  
 Schmidt, L. E., 84  
 Schmidt, M., 46  
 Schmidt, P., 353  
 Schmitz, H., 580  
 Schoepf, 61  
 Schwartz, A., 129, 363  
  
 Schwartz, A. B., 60  
 Secord, E. R., 368, 565  
 Seeley, W. F., 172  
 Séjournet, 381  
 Sekiguchi, S., 135  
 Sellards, A. W., 276  
 Sencert, L., 538  
 Senger, W., 573  
 Sequeira, J. H., 275  
 Serafim, G., 473  
 Sever, J. W., 155, 372, 603  
 Sewall, H., 203, 574  
 Shackleton, W. E., 272  
 Shallenberger, W. F., 191  
 Shannon, W. R., 308  
 Sharpe, H. A., 601  
 Sharpe, N., 571  
 Sharpe, W., 157, 355  
 Shaw, H. A., 346, 368, 462, 556  
 Shearer, T. L., 98  
 Shipway, F. E., 446  
 Shoemaker, G. E., 421  
 Shorten, J. A., 347  
 Sibley, W. K., 484  
 Sicard, J. A., 377  
 Siegel, P. W., 231  
 Silvan, C., 361  
 Silver, D., 145  
 Silverberg, M., 92  
 Silvestrini, L., 144, 360  
 Simmonds, 378  
 Simmonds, B. S., 264  
 Simmonds, M., 86  
 Simmons, C. C., 249  
 Simon, A. R., 311  
 Simon, C., 275  
 Singleton, A. O., 279  
 Siter, E. H., 422  
 Skeel, A. J., 81  
 Skillern, P. G., Jr., 263  
 Skinner, E. H., 130  
 Slemons, J. M., 602  
 Slocum, M. A., 280  
 Sluder, G., 97, 614  
 Smead, L. F., 507  
 Smith, A. J., 26  
 Smith, E. O., 90, 310  
 Smith, F. D., 561  
 Smith, G. F. D., 602  
 Smith, N. R., 276  
 Smith, S. M., 94  
 Smithies, F., 140  
 Smyth, H. F., 163  
 Smyth, J., 549  
 Sonnenburg, C. N., 505  
 Soper, H. W., 143  
 Soresi, A. L., 139, 292  
 Soubbotitch, V., 380  
 Soule, R. E., 266  
 Specht, A., 177  
 Speed, K., 164  
 Spiro, 355  
 Squires, J. W., 33  
 Staehlin, E., 186  
 Staley, R. W., 91  
 Stanley, L. L., 230  
 Stanton, E. M., 503  
 Stark, S., 502  
 Stauffer, W. H., 503, 536  
  
 Stein, A., 402  
 Stenvers, H. W., 425  
 Stevens, T. G., 405  
 Stewart, G. N., 284  
 Stewart, H. S., 127  
 Stewart, L. F., 129  
 Stewart, W. H., 391  
 Stifel, R. E., 144  
 Stincer, R., 197  
 Stoddard, J. L., 400  
 Stokes, J. H., 186  
 Stoll, H. F., 371  
 Stone, C. A., 566  
 Stopford, J. S. B., 156  
 Stout, A. P., 552  
 Stout, P. S., 619  
 Stutzin, 85, 397  
 Sullivan, R. P., 550  
 Swan, J. M., 134  
 Sweet, J. E., 458  
 Swett, P. P., 371  
  
 Taddei, D., 189  
 Tarnowsky, G. de, 266  
 Taylor, G., 145  
 Taylor, J. C., 501  
 Taylor, R. F., 478  
 Telfair, J. H., 411  
 Tennant, C. E., 498  
 Terrell, E. H., 466  
 Terry, W. I., 456  
 Thalhimier, W., 486  
 Thomas, B. A., 421, 422  
 Thomas, G. J., 84  
 Thomas, T. T., 509  
 Thompson, G. S., 231  
 Thompson, W. M., 367  
 Thomson, S., 427  
 Throckmorton, T. B., 131  
 Torrey, J. C., 162  
 Tovey, D. W., 228  
 Towles, C., 580  
 Tracy, S. E., 597  
 Truesdale, P. E., 501  
 Truesdell, E. D., 604  
 Troell, A., 165  
 Tuffier, T., 148  
 Tuley, H. E., 302, 454  
 Tullidge, E. K., 282, 561  
 Turner, D., 288  
 Turner, G. G., 290, 420  
 Turner, J. R., 52, 56  
 Tweedy, E. H., 79  
 Tyzzer, E. E., 274  
  
 Udaondo, C., 362  
 Uffoltz, 494  
 Uffreduzzi, O., 59  
 Ugaz, R. I., 143  
 Ullman, J. S., 164  
  
 Vail, D. T., 611  
 Valdez, G., 461  
 Valens, J. A., 508  
 Van Leeuwen, G. A., 77  
 Van Slyke, L., 78  
 Vantrín, 410  
 Veassy, C. A., 96, 427  
 Vecchi, A., 284  
 Verbruyck, J. R., Jr., 251



# INDEX OF AUTHORS

xxxv

- Verhoeff, F. H., 94
- Vignes, 493
- Vignes, H., 302
- Villa, G. T., 378
- Villaret, M., 354
- Villavicencio, 484
- Villeon, P. de la, 30, 136, 361
- Vilvandr , G., 232, 448, 552
- Vincent, B., 63
- Vinograd-Villchur, 78
- Von Hacker, 232
- Von Willer, P., 237
- Vulpius, O., 477
- Wachenheim, F. L., 143
- Waegeli, C., 505
- Wahl, H. R., 39
- Walker, J., 307
- Walker, J. W. T., 189
- Walker, M. H. Jr., 31
- Wallace, C., 30, 477
- Wallace, C. H., 499
- Walter, W., 18
- Walther, C., 374
- Walther, H. W. E., 311, 607, 608
- Ware, M. W., 544
- Warner, F., 541
- Watkins, T. J., 173, 404
- Watson, C. G., 267
- Watson, L. F., 236
- Webster, J. C., 309
- Wechselmann, 87
- Weeks, A., 229
- Weil, R., 22
- Weinberg, M., 64, 289
- Weller, C. V., 185
- Wells, B. H., 247
- Whipple, G. H., 456
- Whitaker, R., 232
- White, E. W., 513
- Whitman, R., 567
- Wichmann, S. E., 80
- Wiener, J., 258
- Wight, J. S., 146
- Wilcox, H. W., 472
- Wilk, 417
- Willard, D. P., 153, 478
- Williams, J. T., 178, 303
- Williamson, H., 504
- Willmoth, A. D., 277
- Wilmer, W. H., 515
- Wilson, C. F., 517
- Wilson, K. M., 304
- Wilson, W., 517
- Winslow, R., 25
- Wintz, H., 61
- Wolfe, R. D., 178
- Wood, F. C., 59, 62
- Woodall, C. W., 89
- Woolsey, G., 254
- Wright, A. E., 584
- Wyman, M. H., 87
- Yarros, R. S., 605
- Yeomans, F. C., 465
- Young, E. B., 301
- Young, J. K., 154, 263
- Zilva, S. S., 282
- Zobel, A. J., 93





# INTERNATIONAL ABSTRACT OF SURGERY

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## COLLECTIVE REVIEW

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### THE VERMIFORM APPENDIX

#### A RÉSUMÉ OF THE LITERATURE

By W. FRANK FOWLER, M.D., ROCHESTER, NEW YORK

THE literature pertaining to the appendix has been extremely illuminating and in many instances conclusive, during the past year. It is regrettable that a paper of this character cannot include all the excellent articles which were read in its preparation. The writer considers this compilation amply justified by the statistics of Murphy, herein quoted.

#### ANATOMY

Recent embryologic studies of folds, bands, and kinks have again demonstrated that various malpositions of the appendix are dependent upon partial or non-rotation of the gut. Schrup (1) reports a case of this character which presented the usual symptoms of appendicitis and cystic ovaries. At operation the cystic ovaries were found in the ovarian region, but there was no appendix, cæcum, or ascending colon in the normal position. The jejunum occupied the right half of the abdomen. The cæcum was located behind the sigmoid. The appendix was long and congested. There were no adhesions. The mesocolon was apparently attached at the left side of the spinal column. The stomach, heart, and liver were in normal positions. A review of the literature convinces Schrup that complete transposition of the viscera is more common than the type which he reports. The pre-operative location of the heart on the right side would suggest the diagnosis in complete transposition. In childhood non-rotation of the colon accounts for unusual appendix positions.

Corner (2) says: "Clinically, it is frequent to find in children that the cæcum and appendix have not reached the iliac fossa, but have been delayed in their descent or become situated in the umbilical region. It is unusual for the left side of the abdomen or the pelvis to be reached. Appendicitis in the young is commonly atypical, and it is necessary to rely on the generality that acute abdominal disease in children is probably appendicitis." Other causes of malposition of the appendix in the adult are an abnormally long mesocolon and an unusually long appendix which may reach to the left side.

Palamountain (3) reports a case of another type. His patient was a married woman, aged 18, a nullipara, who had had irregular menstruation for the past year. She was awakened by a sudden severe, colicky pain in the midabdomen, which continued all night and was accompanied by vomiting. The pain was localized in the left iliac region and continued all the next day, with occasional vomiting. Castor oil and hot applications did not relieve the pain. The next day she was driven to town. Examination revealed a medium-sized woman in severe pain. She leaned to the left side and kept the left thigh flexed. Menstruation had been delayed two days. Her temperature was 99.5°, pulse 120. The abdomen was tympanitic and extremely tender over the left side; percussion was almost unbearable; muscle spasm was pronounced. There was constant pain over the left lower abdomen. The uterus was slightly enlarged and softened. The

cervix was soft. There was some pain in the left adnexal region, and there was a suspicion of a mass in the left side. A tentative diagnosis of tubal pregnancy was made. Operation was refused until the next day when pain and fever had increased. Operation was performed fifty-eight hours after the onset. It was found that the sigmoid was on the right side; the ascending colon and ilium and a gangrenous appendix were on the left side. Peritonitis was present. Later examination located the liver on the left side and the heart on the right, a complete visceral transposition. No pregnancy existed. Death occurred in fifteen days from peritonitis.

Wade (4) describes some very unusual necropsy findings. The subject, a colored infant 6 months old, died of pneumonia. The appendix, 12.5 cm. long, was found to be congenitally implanted in the inguinal canal. There was no evidence of appendicitis, nor of hernia. It was evident that the testicle, in its descent, had carried the appendix with it. The tip of the latter was close above the testicle. The cæcum was normally located.

#### PHYSIOLOGY

A meager knowledge of appendiceal physiology has been augmented by Heile (5), who states that his studies of the function of the appendix show that the musculature of the appendicular region and of the appendix itself act together to insure effectual peristalsis. The walls of the appendix secrete tryptic and amylolytic ferments. There is also an internal secretion of hormones which stimulates peristalsis when injected into rabbits.

The investigations of Waller and Cole (6), which included the fluoroscopic examination of 27 children, convince them that the appendix is a specialized part of the cæcum, with a definite peristaltic and sphincteric action; that fecal material, normally retained in the appendix from one period of digestion to another, provides bacteria for colonic digestion; in brief, that the appendix is a physiological "culture tube." Incidentally the frequent occurrence of appendicular involvement revealed by examination of healthy children was surprising. Waller and Cole believe that appendicitis is essentially a lesion of early life.

Gunn and Whitelocke (7) learned from experiments that the removed appendix ceases contracting when placed in ordinary Locke's solution, but when placed in oxygenated Locke's solution at body temperature, the contractions recur. In appendices removed at operation "there are typically present larger contractions with (usually) superimposed smaller contrac-

tions." A removed rabbit's appendix showed similar contractions, very much like those of the appendix *in situ*. They conclude that the contractions of the removed human appendix approximate those of the human appendix *in situ*. The nerve supply of the appendix is splanchnic and pelvic visceral. Appendices removed from children under ten years of age possessed the greatest contractions. "A severely inflamed appendix may still show spontaneous movements of not definitely aberrant type."

#### ETIOLOGY OF APPENDICITIS

The most noteworthy contribution to the etiological investigation of appendicitis is the conclusion of Rosenow (8) that this disease, in the absence of foreign body, is usually caused by streptococci; that these bacteria are located in some distant focus of infection; that they simultaneously acquire an elective affinity for the appendix and entrance into the blood stream and are then carried to the appendix. The location and removal of foci of infection is an important measure of appendicitis prophylaxis. The co-existence of appendicitis and throat affections is thus explained. The danger in appendicitis lies in the fact that the anatomy of the appendix favors strangulation and the growth of facultative and strict anaerobes. In a more recent paper (9) on the elective localization of streptococci, Rosenow states that 14 strains from appendicitis produced lesions in the appendix in 68 per cent of the 68 rabbits injected, which is a marked contrast to an average of 5 per cent of lesions in the appendix in the animals injected with strains isolated from sources other than appendicitis. The localizations of the strains from appendicitis, ulcer of the stomach, and cholecystitis as isolated, after animal passage, resemble one another very closely in cultural and other respects. Those from appendicitis are the least virulent, those from ulcer occupy a middle position, and those from cholecystitis are the most virulent. The virulence seems to be one of the factors that determines their place of survival after intravenous injection.

Anderson (10) notes the relationship between appendicitis and tonsillitis. He states that the tonsil is well recognized as a port of entry of many systemic infections, and reports three cases of acute tonsillitis, with apparent subsidence of throat trouble, soon followed by indefinite abdominal symptoms. In each instance a gangrenous appendix was found at operation. He summarizes as follows: (1) It is important to bear in mind the liability of appendicitis follow-



ing acute tonsillitis. (2) The appendicular involvement may be only part of a generalized infection, hence the gravity of such cases is out of proportion to the local symptoms. (3) Such cases tend to become atypical in their clinical course, and after smouldering, suddenly develop fulminating symptoms. (4) Chronic tonsillar infections should be kept in view as the possible cause of similar infections of the appendix. (5) At least some degree of local tenderness and rigidity is almost always to be elicited on careful examination of the abdomen in the right iliac region in appendicitis, though in rare cases these signs may be absent.

The investigations of Savini (11) have convinced him that minute traumatic lesions of the appendix mucosa are very frequent. They are due to the presence of particles of carbon and iron. If these microscopic ulcers become infected necrotic appendicitis results. If they remain aseptic the condition found at operation depends upon the stage of connective-tissue repair. All stages of repair may be represented in different portions of the same appendix. He considers obliteration of the lumen to be invariably pathological.

Hughes (12) believes that the initial cause of appendicitis is mechanical, a rotation of the appendix about its mesentery, and the degree of rotation determining the severity of the attack. This movement is made possible by: (1) a movable, loaded cæcum; (2) a loss of tone in the abdominal muscles. He affirms that a proper amount of exercise would decrease appendicitis.

Battle (13) reports two cases in which the mucous membrane of removed appendices was deeply pigmented a brownish black. The discoloration was confined to the mucous membrane and evidently extended into the cæcum. He had previously reported four similar cases. The patients were all women, all of whom had suffered from chronic constipation, and had had attacks of appendicitis. The deposit proved, on analysis, to be iron. Only one patient had taken iron. Battle believes that the rollers which grind the wheat for flour are the source. He found unusual traces of iron in flour, but it could not be separated from the flour by a magnet. He concludes that iron particles may be an etiological factor in appendicitis. The sharp bits cause traumatic ulceration of the mucous membrane.

Suzuki (15) made microscopical examination of 108 appendices removed at operation. He concludes that: (1) The oxyures may be found in the lumen, mucosa, or submucosa of the appendix without producing symptoms or anat-

omical changes. (2) The presence of oxyures in appendicitis is usually accidental. (3) A true inflammation is provoked when many parasites penetrate the wall of the appendix and the abraded tissue becomes infected from the lumen. It is extremely rare. (4) The oxyures may cause a non-inflammatory, painful morbid condition in the appendix accompanied by traumatic destruction of the tissue and hæmorrhage, a pseudo-appendicitis. (5) Some defects of the appendix wall are artefacts, but occasionally a cleft is formed by the parasite.

Sherrick (16) reports three cases of traumatic appendicitis. Case 1. A young man, plowing, received a hard blow in the right side of the abdomen by the plow handle. Severe pain followed. He ran a typical course of appendicitis and died on the fifth day, having refused operation. The autopsy showed peritonitis, and a perforated appendix with a concretion in the perforation. There was no history of previous attacks, but necropsy revealed evidence of previous pathology. Case 2. A traveling salesman, by the derailment of a car, was thrown against the back of the seat in front of him. The severe initial pain soon disappeared, but returned a few hours later with typical symptoms of appendicitis. Operation revealed a perforated, gangrenous appendix. There was a history of two preceding attacks. Case 3. A boy, aged six years, was struck in the abdomen by his brother's elbow. He immediately complained of severe abdominal pain, which continued with vomiting and the ordinary symptoms. A physician was called on the third day. Immediate operation revealed peritonitis, a perforated appendix with gangrenous mucous membrane, and a calculus. Sherrick quotes the conclusions of Deaver as follows: "(1) From personal experience and a study of the literature, trauma is never the direct exciting cause in a normal appendix. (2) Acute appendicitis can follow a severe blow upon the abdomen, or severe muscular strain, but the appendix will present evidence of pre-existing pathology. (3) Acute traumatic appendicitis is most frequent in males, due to their more active life, occurring between the ages of 10 and 25. (4) In an appendix previously diseased the liability to an acute attack following injury depends upon the degree of injury and the pathology in the appendix at the time of injury. (5) The mortality is high, due to late diagnosis, rapid gangrene, and perforation, and late operation. (6) When the history suggests traumatic origin, a record should be made of the cause of the injury and also of the operative findings."



## PATHOLOGY

Stickney (17) reports the case of a woman, aged 39, who had had symptoms of chronic appendicitis for a year. At operation a small clubbed appendix was removed. The clubbed tip was a circumscribed solid tumor without lumen; examination revealed 5 small myomata in this area. Out of 647 reported cases of tumor of the appendix, only 3 were myomata.

Primary carcinoma of the appendix, although formerly considered an extremely rare pathology, is stated by Meyer (18) to occur in 0.5 per cent of removed appendices. Meyer reports three cases. The diagnosis was made microscopically. Pre-operative diagnosis is impossible, and diagnosis at operation unusual. The condition is histologically malignant, but clinically benign; nevertheless clinically malignant cases do occur. The tumor occupies the appendix tip with obliteration of the lumen. The growth was noted to be of a yellowish brown color in one case. Rasi-sieur (19) reports two cases. In the first the yellow color was noted on section and the diagnosis made microscopically. The same color, observed on section in the second case, led to macroscopical diagnosis, which was later confirmed by the microscope.

Pseudomucinous cyst is a truly rare lesion. Phemister (20) states that it results from the slow accumulation of an altered secretion of the appendix produced by a mild inflammatory process. Most of the cases have occurred between the ages of 35 and 50. The fluid which accumulates during an acute attack of appendicitis varies from serous to purulent or ichorous. The accumulation either disappears rapidly with the subsidence of the acute inflammation, or escapes into the peritoneal cavity through a perforation. Persistence of this fluid with chronic cyst formation is rare. However, cases are reported of stenosis of the proximal portion, with pus accumulation in the part beyond, leading to the formation of chronic empyema of the appendix. Chronic hydrops following milder attacks in which the appendix is filled with a simple serous exudate is also very rare, because the mucous membrane is preserved in such cases, and its secretion changes the character of the contents so that pseudomucinous cysts usually result. The cause of the stenosis and retention of secretion is uncertain. It is probable that inflammation and involution are associated in varying degrees in the causation. Often there is no history of preceding attacks of appendicitis, and if so they have been mild. The lumen of the

appendix is filled with a transparent, gelatinous material, which is usually quite thick. It contains no faeces and usually no bacteria. There are few clinical symptoms and development is slow and painless. Sometimes the first symptom is the appearance of a mass in the right, lower quadrant of the abdomen. Phemister reports a case in which the removed appendix was 21 cm. in length, and 21 cm. in its greatest circumference. It was filled with a thick, gelatinous material. Portions of the wall were thickened and some of these areas suggested calcified plaques.

Phemister states that pseudomyxoma peritonei results from rupture of the cyst. Frankel in 1901 described the first case arising from a perforated colloid cyst of the appendix. About 20 cases have been reported since. Perforation is usually symptomless and the pseudomucinous material is disseminated on the peritoneal surface in various sized masses. There are usually no symptoms subsequent to rupture as the contents are sterile. This condition is cured by removal of the cystic appendix, as the source of the material is removed and the remaining portion is absorbed. In a case reported by Ogilvie (21) the patient complained of something solid "tapping him on the inside" at the appendiceal region while he followed his daily work. A hard irregular mass was palpable over McBurney's point. A roentgenogram revealed a shadow which might be a calcified cyst of the appendix or a ureteral calculus. At operation a calcified appendix was removed. Examination revealed a pseudomyxomatous cyst whose walls were almost entirely calcified. The base of the appendix contained mucoid material, while the distal portion was filled with pus.

Pfeiffer (22), in a paper on appendicular obliteration, states that chronic appendicitis pathologically includes low grade inflammation and end-results of such an inflammation. The latter is evidenced by cicatrices, strictures, kinks, and by destruction and replacement of mucosa by fibrous tissue, with obliteration of the lumen. The latter is not a physiological process. In 100 surgically removed appendices the occurrence of obliteration was most frequent during the age of active inflammation (20 to 30 years), and was not dependent upon the advanced age of the patient. This contention is borne out by a case recently operated upon by the writer. The patient was 70 years of age, and the appendiceal mucosa was gangrenous with obliteration of the lumen only at the tip. Pfeiffer classifies three types of symptoms due to an obliterated appendix: (1) reflex, due to irritation of the nervous



mechanism of the appendix; (2) local, due to mesenteric and peritoneal contractions and inflammatory bands and adhesions affecting the appendix or contiguous bowel; (3) consecutive symptoms, general and local, consequent upon disturbed function of the illeocaecal region. Simple appendectomy avails for reflex symptoms, but in local and consecutive symptoms only in so far as the operation permanently relieves the symptom producing contractions, sclerosis, or adhesions. The determination of these latter conditions and the appropriate treatment, therefore, awaits further observations and experience.

Another type of obliteration is described by Bonn (23), who reports seven cases of filiform appendices. A filiform appendix, so named and described by Eastman (24), is a slender, white cord usually covered, entirely or in part, by a pericolonic membrane. If only partially covered the unconstricted portion may be of normal size. The end may be free or attached to the parietal peritoneum. The constricted part is without lumen. A filiform appendix may be mistaken for an adhesion, or the appendix may be considered congenitally absent or pathologically destroyed. Bonn believes that two processes are associated in the production of the filiform appendix; namely, a chronic inflammation and an involution due to constriction by the accompanying pericolonic membrane.

Judd (25) reports a case of "auto-amputation" of the appendix, a term used by Murphy (26). Judd's case was a young man with indefinite symptoms of appendicitis. During a kidney operation the appendix was brought into the incision. It was connected with the cæcum only by a fine adhesion. Pinching at this point with the fingers entirely separated the appendix from the cæcum. There was no opening into the cæcum. The proximal end was also closed. The appendix was 7 cm. long, not dilated, and contained a small amount of mucoid material. It showed the lesions of a chronic interstitial inflammation.

#### DIAGNOSIS

The diagnostic value of rigidity of the right rectus has been so greatly emphasized, according to Randall (27), that many cases of appendicitis have been neglected in the absence of this sign. He states that ordinarily rigidity of the right rectus is a reliable guide, but in some cases rigidity of the right external oblique is present in its stead. These cases are mild, many patients are about and attending to business, and a high polynuclear count is the only indication of a

serious condition. In over 20 cases seen the past year by Randall, with rigidity of the right external oblique, and not of the right rectus, the appendix was retrocaecal or retrocolic.

Ten Horn (28) reports that traction upon the right spermatic cord produces pain in appendicitis. This he noted in 12 out of 15 cases. The cord is grasped above the testis and gently pulled without making pressure on the testis. He believes the pain to be due to irritation of the peritoneum about the internal ring. He doubts the value of the cremasteric reflex sign.

Ruthkevitch (29) believes that chronic appendicitis is frequently diagnosed as some functional gastric or intestinal disorder of nervous origin. Many patients give no history of previous attacks or of characteristic pain. Constipation, tenderness at McBurney's point, and temperature are often negative. Ruthkevitch could not elicit Rovsing's sign and leucocytosis was present only once. He concludes that there are no diagnostic signs of chronic appendicitis. Palpation is the best guide. He palpated the appendix in 60 per cent of cases and pain was produced in 88 per cent. The palpation also caused pain in the upper abdomen at the same time in many cases. His method of palpation is as follows: The flexed fingers of the right hand are pressed down between the external wall of the cæcum and the abdominal wall. The fingers are then extended and an endeavor made to deflect the cæcum toward the median line. This manipulation invariably produces pain in chronic appendicitis.

Bischoff (30) distends the previously emptied bowel with air through a rectal tube. By this means pain over McBurney's point is elicited if the appendix is diseased (Bastedo's sign). Pain over the appendix as ordinarily observed should not be considered diagnostic of appendicitis as it is caused by other conditions.

Lanz (31) states that frequent and painful urination in children may be an early sign of appendicitis. When the finger is introduced into the right inguinal canal the muscles contract about it if the appendix is inflamed. The cord is painful and tender. Contrary to Ten Horn, Lanz believes that the cremasteric reflex is weak or absent in acute appendicitis.

Sutton (32) reports a case of appendicitis with unusual features in a young, unmarried woman. At 5 a.m. he found the patient suffering from intermittent, colicky, abdominal pain; abdomen tympanitic; temperature and pulse normal. No abdominal tenderness. He gave soap-suds enema, liquid diet, and castor oil. Diagnosis: acute intestinal indigestion. At 4 p.m. the tempera-

ture was 100°, pulse 90; pain as before; slight localization of pain over McBurney's point. Abdomen slightly tympanitic. Return of enema good, constipated mass. Treatment: ice-bag to right iliac fossa, liquid diet. Diagnosis: acute appendicitis. Called at 5 a.m. next day; the patient was suffering from sharp, shooting pains in the vulva, in addition to abdominal pain of the same character as before. Four ounces of clear, straw-colored urine were obtained by catheterization. Temperature 102°, pulse 110; marked tenderness over McBurney's point; slight rigidity of right rectus. On consultation immediate operation was advised. At operation the distal end of the appendix was found in a ruptured abscess, firmly adherent to the posterior wall of the bladder, and a beginning peritonitis. Sutton believes the symptom of sharp, shooting pain in the vulva indicates an adhesion of the posterior wall of the bladder. This symptom is explained by the fact that the vulva and bladder are supplied in part by the sacral plexus. The diagnosis was complicated in this case by ovarian pain and by inadvisability of bimanual examination, as the patient was a virgin.

Randolph (33) reports the case of a man who had an acute illness a few months before consulting him. This illness confined the patient to bed and was accompanied by fever. The diagnosis was sciatic rheumatism. Since then his health had been poor. He had lost weight, had dyspepsia and palpitation and was unable to work. He was apprehensive and thought he might have heart-disease or cancer. A clear cut diagnosis was impossible. Under hygienic treatment he improved. Three years later he had an acute abdominal attack, which was diagnosed as appendicitis. At operation the appendix was found to be very long and its distal end was situated against the spinal column, close to the upper division of the lumbosacral cord. There was a small abscess at the appendix. Randolph concludes that the initial attack of "sciatic rheumatism" was acute appendicitis, with peripheral pain in the sciatic nerve due to the proximity of the inflammatory focus to its fibers of origin. This case illustrates that so-called sciatica is a symptom, not a disease, and most often the etiologic factor is to be found above the level of the sacrosacral notch.

The roentgenoscopic evidence in appendicitis is discussed by Eisen (34). He states that the first reports of X-ray demonstration of the appendix were made by English and French roentgenologists in 1913, but Americans realized the value of X-ray examination in 1912. Eisen con-

siders X-ray findings a valuable aid to diagnosis. A normal appendix lumen does not rule out inflammation. He reports 36 cases, from 16 to 60 years of age. In 6 there was a stricture near the tip with inflammation distal to the stricture. He calls these cases "drum stick appendicitis." No classical symptoms were present, nor clinical diagnosis made, in the majority of his series. Diagnosis was doubtful in most; in some the clinical diagnosis of gastric ulcer was made, while in others suspicions of duodenal or gall-bladder involvement existed. In 30 out of 36 cases he made roentgen diagnoses of appendicitis, which were confirmed at operation. The X-ray reveals the cause of vague stomach symptoms in appendicitis to be due to pylorospasm. Eisen considers the most valuable roentgen symptom to be pain on direct pressure over the appendix, or when making traction upon or displacing it.

Imboden (35) states that the probable reason the normal appendix is not always visualized is that it fills and empties between observations. Failure in filling may also be due to: (1) obliteration of its lumen; (2) adhesions or kinks near the proximal end; (3) an acute attack with infiltration of the mucosa; (4) the lumen may be obstructed by a fecolith or filled with contents not bearing an opaque material; (5) it may be retro-caecal, in which event if the cæcum is partially empty the stereoroentgenogram usually reveals it. He concludes that: (1) Retention of appendiceal contents after the cæcum is empty should be regarded as suggestive of chronic appendicitis. (2) A tender area located in the course of the appendix must be regarded as suspicious. (3) The Trendelenburg position affords an unexcelled opportunity to study this area. (4) Stereoroentgenography affords the increased amount of information usual to this method in general.

In response to the following questions: (1) What is the significance of barium retention in the appendix? (2) What is the significance of inability to demonstrate the appendix by means of the roentgen ray? (3) What are the roentgen signs of appendicitis? Personal communications were received, as follows:

Dr. James T. Case: "Barium in the appendix is an abnormal phenomenon. It by no means indicates surgery. If, by accurate palpation of the barium-filled appendix, we are able to determine adhesions, kinking, irregularities of the lumen, poor drainage (two to three days or longer), then we have surgical indications. The poorer the drainage the greater the danger. Inability to demonstrate the appendix by means of the roentgen ray depends upon: First, obstruc-



tion of the lumen by an obliterating appendicitis, by turgescence of the tissues attending a recent inflammation, or kinking or adhesions near the base of the appendix. Second, the appendix may fill, but lie so definitely retrocæcal, closely adherent to the cæcum, that it cannot be seen. Also great local tenderness or rigidity of the abdominal muscles may prevent accurate manipulation. Nevertheless, when the appendix remains filled longer than the cæcum, we can demonstrate it. Third, failure to use the fluoroscope. Not once in 50 times is the appendix seen in the ordinary roentgenogram. Not even simple fluoroscopic observations will suffice. One must manipulate with the hands or with the wooden spoon or both. In acute appendicitis manipulation is unwise, but a barium enema will often identify tenderness on pressure as being over the appendix. I have discovered several cases of left-sided appendicitis in this manner. As to the roentgen signs of appendicitis: A. In acute appendicitis no signs are needed, except the barium enema, as above noted. B. The roentgen signs of a chronic condition are: (1) poor drainage; (2) localized tenderness on accurate palpation done under fluorescent screen guidance; (3) kinking; (4) irregularities in the lumen so that the appendix is bulbous at the tip, and especially poorly drained at the tip; (5) associated adhesions to the cæcum and terminal ileum; (6) unduly long or unduly large appendix. All these signs need not be present. The diagnosis should not be based upon roentgen findings alone." (Dated December 9, 1915.)

Dr. G. E. Pfahler: "Barium retained in the appendix after the bowel is entirely empty probably indicates a relaxed or inflamed appendix. Inability to demonstrate the appendix by means of the roentgen rays may mean that the appendix is obliterated or that it is filled with some other material and will not permit the barium to enter it. The roentgen signs of appendicitis are localized tenderness over the appendix, fixation, angulation, constrictions, local dilatations, adhesions about the cæcum, incompetent ileocæcal valve, and undue retention." (Dated December 9, 1915.)

McWilliams (36) suggests the difficulty of diagnosis in cases of chronic appendicitis in which local pain and tenderness are mild or absent. These cases are characterized by distant reflex disturbances. He classifies them as follows: (1) Pain type, characterized by colics in children, simulating gastric or duodenal ulcer, or gallstones: This class includes cases of pylorospasm. (2) Nausea type. (3) Vomiting type. (4) Gas

type. (5) Intestinal type characterized by toxæmia producing anæmia; chronic constipation; chronic diarrhoea and colitis. (6) Bilious or toxic type with headache. (7) Neurasthenic type. Medical treatment is of no avail. He warns against the use of such terms as nervous indigestion, neurasthenia, gastralgia, intestinal toxæmia, and bilious headaches as indicating a functional disturbance unless an organic basis can be ruled out absolutely.

Morley (37) calls attention to the frequent errors in the diagnosis of chronic appendicitis, particularly that type in which there has never been an acute attack, and which is characterized by chronic pain and some tenderness, usually accompanied by constipation. He considers Lane's kink to be a practically symptomless congenital band. Jackson's pericolic membrane, also of congenital origin, may sometimes produce symptoms simulating chronic appendicitis, but more often these symptoms are due to the "mobile proximal colon" associated with it. The latter condition may be present without the membrane and with or without appendicitis. Inflammatory bands in this region are tough, fibrous, opaque, and not very vascular, while congenital adhesions are translucent, more yielding, filmy, and vascular. Morley believes that chronic inflammation of the right adnexa is the commonest cause of erroneous diagnosis. Often a precise pre-operative diagnosis is impossible. An adequate incision is imperative, preferably vertical through the right rectus.

Longo (38), in a strikingly similar paper, groups these confusing conditions under the term "pseudo-appendicitis." He, however, maintains that Lane's kink produces symptoms simulating chronic appendicitis.

Kenefick (39) believes that spasm of involuntary muscles may be caused by local irritation in chronic appendicitis. He cites three cases, one of false angina without subjective symptoms of appendicitis, the second, oesophageal spasm during deglutition with a negative history of appendicitis. Diagnosis of appendicitis was made by eliciting sharp pain on deep pressure over the appendix and by roentgenograms. Operation was refused in both instances. In the third case the patient was healthy until three years ago when she began to vomit immediately after eating. Two months later she had two attacks of acute appendicitis which subsided. She continued to vomit. Within a month an exploratory incision was made. The stomach was normal, the appendix was examined but not removed. Kenefick made the diagnosis of chronic

appendicitis by palpation and X-ray. This was confirmed by operation and the patient has regained her normal health. Kenefick says, "The irritation or traction spasm originates at some particular attachment of the appendix to a branch of the mesenteric plexus and reaches the musculature of the stomach by way of the mesenteric and celiac plexus as follows: (1) hepatic plexus and plexus gastroduodenalis to the pylorus; (2) plexus gastro-epiploica dextra to the pylorus and lesser curvature; (3) plexus gastroduodenalis to the fundus and region of greater curvature. Afferent impulses in general pass from an inflamed appendix to the mesenteric ganglia, suprarenal ganglia, vagus to medulla and cortex independent of the spinal centers."

Aaron (40) previously had noted that pressure over the appendix caused epigastric pain. Recently, while examining a case of chronic appendicitis with the fluoroscope he induced a pylorospasm by pressure over the appendix, and coincident epigastric distress of which the patient had frequently complained. Aaron believes this reflex pain is caused by pylorospasm, and ventures the opinion that the gastric symptoms of appendicitis are also due to this spasm.

Aynsworth (41) states that the average incidence of appendicitis in children up to 15 years of age is 15 per cent. The large number of pus cases are due to late diagnosis and rapid development. Cases have been reported as early as the fifth week. Failure to make a diagnosis is due to oversight rather than to symptomatology. Unfortunately other acute, *mild* abdominal conditions are common, leading to late diagnosis, and children do not readily localize painful areas. The history is scanty. Nevertheless Aynsworth believes that the diagnosis can be made fairly early. Abdominal pain is usually the first symptom. Children with even slight peritoneal involvement protect the abdomen very carefully. The appendix may be anywhere in the abdomen. When it lies in the pelvis there may be no abdominal rigidity, and tenderness only deep in the pelvis. In the presence of bladder irritation or doubt of diagnosis a rectal examination should be made. Pain, vomiting, tenderness, rigidity in any part of the abdomen, and fever strongly indicate appendicitis. Gastroenteric affections must be excluded. Examination of the lungs should be made in children whenever an acute abdominal condition is presented.

Fleischner (42) reports the following case: A child 8 years of age became acutely ill with

fever, vomiting, and pain in the right side of the abdomen. Twelve hours after the onset there was a leucocytosis of 30,000. A tentative diagnosis of appendicitis was made. Upon examination light percussion of the chest revealed relative dullness over the right lower lobe of the lung and on auscultation the breathing was slightly diminished. There was no distention of the abdomen and abdominal respiration was normal. Considerable pain was complained of over McBurney's point and extending upward, but neither tenderness nor rigidity was commensurate with the pain. Operation was postponed for twelve hours. At this time pneumonia symptoms were more evident. In twenty-four hours there was no doubt of pneumonia and pain had disappeared.

Gage (43) states that pain, tenderness, and muscular spasm in the right iliac region occur during typhoid and render differentiation from appendicitis difficult. The difficulties are increased by the fact that the appendix does share in the intestinal lesions of typhoid, as instanced by case reports of ruptured typhoid ulceration of the appendix. Gage divides the appendicitis of typhoid into 3 classes: (1) appendicitis, an accidental accompaniment of typhoid, or a chronic condition become active; (2) typhoid ulceration of the appendix; (3) appendicitis occurring so soon after typhoid as to be due probably to it. An unusual case of post-typhoid appendicitis was reported by Stokes and Arnick (44). A young man who had had typhoid 13 years before, developed acute appendicitis. The appendix was gangrenous and the bacillus of Eberth was cultured from it. The Widal reaction was positive. Was he a carrier? Several cases have been reported of accidental complication of appendicitis without evidences of typhoid involvement, but due to mixed infection without typhoid bacillus. Gage reports a case in which acute right iliac pain, rigid rectus, and vomiting developed when the typhoid temperature had been normal for five days. The leucocyte count rose rapidly to 18,000. Laparotomy for probable perforation revealed an unruptured gangrenous appendix lying in a walled off abscess. The pathologist reported typhoid ulceration and the presence of typhoid and colon bacilli, as well as streptococci. Gage believes that careful examination of removed appendices for so-called accidental inflammation would reveal the presence of typhoid lesions in many cases. He emphasizes the importance of a rising leucocyte count.

Winslow (45) reports 4 cases which were oper-



ated upon early for rather typical symptoms of appendicitis. In these the Widal reaction was negative. Operation revealed a lack of appendicular pathology but the presence of enlarged retroperitoneal glands, thus leading to a tentative diagnosis of typhoid. Subsequently the cases ran through typical typhoid phases. Typhoid should be recognized by a low leucocyte count (although it may be low in serious or fatal appendicitis), by less muscular rigidity and tenderness, by more headache and the liability of typhoid occurring during the fall. Mistake in diagnosis may be avoided in taking the history by determining whether fever or pain occurred first, whether pain was sudden and severe, or whether it followed headache, malaise, and fever. If rigidity is not pronounced, even though there be pain and tenderness in the right lower quadrant, and if the leucocyte count is low, do not operate until the diagnosis is clear.

Sappington (46) reports the case of a young lady, aged 21 years, who had complained of anorexia and malaise for three days and was then suddenly taken with general abdominal pains, without nausea or vomiting. Her temperature rose to 102.4° F., pulse 120, respiration 20, white cell count 12,000. The next morning, December 27th, her temperature was 103° F., pulse 118, with pain and tenderness localized in the right iliac fossa. She had received the last of three immunizing injections of typhoid vaccine the preceding month. A diagnosis of appendicitis was made. Operation revealed an appendix which did not account for the symptoms. Her temperature continued between 103° and 104° F., and pulse above 110. December 28, leucocytes were 11,600; December 29, negative blood culture; December 30, Widal reaction, as anticipated from immunization, was positive; December 31, second blood culture was positive for typhoid bacillus; January 4, leucocytes were 5,400 and rose spots appeared. The patient ran an average typhoid course to recovery.

Wolfsohn (47) reports several cases sent to the hospital with diagnoses of appendicitis. They were not acutely ill, but for a number of days had suffered malaise. They all had diarrhoea and pain in the abdomen, the diarrhoea being unaffected by medication. There was tenderness over the appendiceal region without rigidity of the abdominal wall. No typhoid bacilli were found in the stools, urine, or blood. Appendectomy was performed in 10 or 12 cases, followed by the immediate disappearance of symptoms and prompt recovery. The lesions in the appendix were mild, but in several cases cultures of

typhoid and paratyphoid bacilli were grown from the inner walls of the appendix although absent elsewhere. These patients had previously received typhoid vaccine which apparently had rendered their tissues immune to the bacilli, with the exception of the appendix.

In a review of 157 cases of kidney and ureteral stone Cabot (48) notes that of 26 patients who had been previously subjected to unnecessary operation for various non-existent abdominal conditions, 10 had had appendectomy and 7 had had exploratory laparotomy. He states that renal colic is absent in many cases and when present may be mistaken for the pain caused by other abdominal lesions. The urine frequently remains normal. The X-ray is often negative, but a case in which the pain symptoms, X-ray evidence, and urinary findings are all negative, is very unusual.

Braasch and Moore (49) state that when the pain of stone is localized to the area of the lower ureter, particularly on the right side, it may so closely simulate appendicitis that, given a normal urine, "an exploration of the appendix might be justifiable without preliminary roentgenographic examination."

Gage (50) states that in acute appendicitis the ileocolic glands may be moderately enlarged. They show merely inflammatory changes on section. He reports 11 cases, diagnosed and operated upon by him for appendicitis, in which the appendix was normal or approximately so, but he discovered several enlarged glands in the ileocolic mesentery. These were tuberculous. He excised the glands and removed the appendix. The prognosis of this local tuberculosis he believes to be favorable following excision.

Case reports of Meckel's diverticulitis by Watson (51) and Strode (52) again demonstrate the impossibility of making pre-operative differentiation between this condition and appendicitis.

Riggs (53) reports four cases of effusion into the bowel wall in which the symptomatology closely resembled appendicitis. A doughy sensation in several cases suggested abscess. The effusion occupies the last few inches of ilium and may extend to the caecum. The lesions consist of a reddish, sharply defined thickening of the bowel wall and mesentery. He regards these as due to toxæmia, with such outward evidences as urticaria, erythema, angioneurotic oedema, and purpura.

Waller (54) reports the case of a girl 8 years of age who was seized with sudden, violent abdominal cramps while at stool. She lost consciousness

but soon recovered. Nausea and vomiting were followed by relief. There was slight tenderness in the lower right quadrant. At operation, upon delivery of the appendix, the partially anæsthetized patient strained causing the apparently normal appendix to inflate alarmingly. Pressure was required to accomplish deflation. The appendix contained a No. 6 bird shot. There were no inflammatory changes. Waller believes that this case accounts for hitherto puzzling attacks of acute colic in which the appendix was not pathological but contained small concretions or foreign bodies, these concretions or bodies acting as a ball valve, preventing ready deflation and producing symptoms of colic.

Strauss (55) reports five cases of extraperitoneal appendicitis which he classifies under three heads: (1) Those presenting a straightforward picture of appendicitis. In these cases the appendix cannot be found until the peritoneum is incised near the cæcum and the latter lifted up. (2) Those simulating a perinephritic abscess. This type is characterized by pain, tenderness, and swelling in the right lumbar region. Through the lumbar drainage incision it may be possible to remove the appendix without entering the peritoneum. (3) If the appendix is not removed a persistent fæcal fistula may result. Fætid pus obtained from a lumbar abscess is probably due to disease of an extraperitoneal appendix. Careful search should be made before deciding that the appendix is absent or has sloughed away.

Lichty (56), who reports about 700 cases of appendicitis from the view point of the internist, is impressed with the fact that many cases of supposedly chronic appendicitis are operated upon without relief of symptoms. He summarizes as follows: (1) A close co-operation of physician and surgeon is necessary to obtain the best results. (2) Since only 8 patients out of about 700, under all conditions and circumstances, died, the disease need not be considered with such alarm. (Lichty refers to cases hurriedly diagnosed and operated upon for chronic appendicitis in which there may be no pathology in the appendix.) (3) An early operation during the first acute attack is not only safest but will likely prevent a life of more or less chronic invalidism. (4) A careful routine study of the leucocytes in acute appendicitis is of diagnostic value. (5) A routine study of the gastric secretion in chronic appendicitis yields valuable information (hyperchlorhydria). (6) The end-results in cases of chronic appendicitis are often unsatisfactory and cannot be definitely foretold.

#### TREATMENT

Guthrie (57) reports the use of the serum and vaccine of colon bacillus in 22 cases of appendicitis. All recovered without operation. There was one recurrence; here, too little of the serum was used and no vaccine. The relief from pain was striking. Serum should be used before pain becomes localized. He gives 20 ccm. of the serum and a few days later 100,000,000 colon bacillus vaccine to prevent recurrence. The "fixation of complement test" should be made and if some other organism is the determining cause a corresponding serum or vaccine is indicated.

Syms (58) reports a mortality of 100 per cent in a series of peritonitis cases of appendiceal origin in 1904. The mortality of a series in 1912 was 16 per cent. Improved operative methods have decreased the death-rate. Syms agrees with Murphy that perforative peritonitis tends to be localized or general from the very start, depending upon the kind of bacterium responsible and the patient's resistive power. He disagrees with Stanton (59) in his conclusion that dissemination of peritoneal infection is largely a matter of peristalsis and that the quiet afforded by withholding food and water by mouth will prevent its spread. Syms believes in immediate operation at any stage of appendicitis. If infection is present a rapid, simple operation, with drainage, is indicated, the drains being placed between the intestines and the parietal peritoneum. The after-treatment consists in: washing the stomach if there is nausea, vomiting, or extreme sepsis, and withholding food and water per mouth for 24 to 48 hours; keeping the patient in the Fowler position; use of the Murphy drip; clear by the lower bowel by enemata to relieve distention; no cathartics, few drugs, no opium; stimulation if necessary. If the pulse or heart is weak, the Fowler position should not be used. Post-operative ileus is due to spreading peritonitis, septic infection, excessive manipulation at the time of operation, faulty placing of drains, failure to empty the lower bowel before distention, and the use of morphine or opium.

The principles of the Ochsner method, as outlined by Hicks (60), are as follows: The medical treatment, if it can be called such, consists in the prohibition of food, physic, and generally of water; lavage at times; rest in bed; mild heat applied locally. All cases seen in the first 24 hours are operated upon at once if willing; a few are operated upon on the third day; but cases from the fourth to ninth days, especially if



very ill, are treated medically until a safer time for operation.

Deaver and Pfeiffer (61) agree with Ochsner in their statement that early operation in appendicular peritonitis is the rule, but is of no benefit and may be harmful in cases of more than 40 hours' duration, with signs of diffuse peritonitis and marked systemic toxæmia. Removal of the appendix is of no avail as that organ is buried in a mass of omentum and coils of intestines and is incapable of adding to the infection. Spreading peritonitis cannot be checked by surgical means. The best treatment is supplying rest to the alimentary tract by withholding everything by mouth. The Fowler position and enteroclysis are important. When the outlying inflammation subsides and localizes about the appendix the latter may be removed or the pus which is about it. The after-treatment consists in the sitting posture, enteroclysis, nothing by mouth, and careful nursing.

#### ANÆSTHETIC

In a consideration of choice of an anæsthetic Bevan (62) states that drop ether should be chosen today as the standard general anæsthetic when a prolonged anæsthesia is desired with relaxation and unconsciousness. Gas should be chosen in short anæsthesias and in special cases, such as kidney insufficiency. Local infiltration anæsthesia may be used when the surgeon has the full co-operation of the patient and when the field of operation can be completely infiltrated and anæsthetized by a safe amount of novocaine and epinephrin. He believes that nerve-blocking should as a rule be confined to nerves which are exposed by a dissection done under local infiltration, as in a herniotomy.

Harris (63) reports 34 appendectomies done under nerve-blocking. The appendix is insensitive, but novocaine must be injected at the base of the meso-appendix. The method is safe and free from the dangerous sequellæ of general anæsthesia. The psychic element has been overestimated. Dread of operation is based upon fear of pain which may be abolished by assurance that there will be none; upon loss of consciousness, which does not obtain with local anæsthesia; and upon fear of the outcome. This fear may be mitigated somewhat by the fact that patients are apt to consider an operation which can be done with local anæsthesia as less severe than one requiring a general anæsthetic. Nerve-blocking teaches the surgeon to employ gentle manipulations which tends to decrease shock.

Braun (64) says: "The writer confesses that

after many attempts, some of them dating back a long time, he always returns to the same conclusion; that is, to perform operations on the appendix under general anæsthesia without local anæsthesia."

#### INCISION

Our views in regard to the most desirable incision for appendix removal have recently been modified. Brickner (65) states that the McBurney incision is satisfactory for a simple appendectomy, but a presumably simple appendectomy may resolve itself into a more extensive operation requiring liberal exposure. The incision is not suitable for exploration of the upper abdomen, so often indicated, nor does it lend itself to enlargement. Its routine use would lead to otherwise avoidable technical difficulties, and conditions might be overlooked which would be observable through the right rectus incision.

Harrigan (66) describes a modified McBurney incision for the treatment of appendicitis and pelvic disease as follows: (1) After removal of the appendix the peritoneum and internal oblique and transversalis muscles are sutured. (2) The skin incision is extended downward and inward toward the median line. (3) The aponeurosis of the external oblique is divided to the point where it fuses strongly with the anterior rectus sheath. (4) The anterior rectus sheath is incised parallel to the line of fusion of the external oblique muscle, leaving a sufficient margin internally to suture. (5) The rectus muscle is freed, displaced, and retracted outward. (6) The peritoneum is incised.

Rockey (67) describes the transverse incision as follows: The skin incision, 2 to 2.5 inches long, is made directly transverse with its center at or near McBurney's point. The outer part of the rectus sheath is incised, dividing the tendinous border and the aponeurosis of the muscles on a directly transverse line. The scalpel handle is inserted below and the finger above and the wound pulled wide apart without cutting any muscle fibers. The external oblique fibers are retracted at the outer angle and the rectus at the inner angle. The peritoneum is divided transversely. Definite pre-operative diagnosis is essential as this incision is not adapted to other pathological conditions. In interval cases and acute cases before rupture the operation is facilitated and firm union obtained. In pus cases it gives direct approach. Drainage is placed in the outer angle of the incision, and the outer side of the cæcum. Rocky believes that liability to hernia is diminished.

## OPERATIVE TECHNIQUE

Torek (68) has described a combined incision for appendectomy and right herniotomy. The skin incision usually employed in herniotomy is prolonged outward and the appendix is removed through a muscle splitting incision beyond the internal ring.

An interesting variation of operative technique is described by DeTarnowsky (69). He advocates the routine removal of the appendix through the internal inguinal ring during right herniotomy. His results have been satisfactory in over 50 cases. The cæcum is distant only 4 to 6 cm. from the internal ring and can be partially or totally delivered. If the ring admits two fingers or can be easily stretched to admit them, he delivers the cæcum with the index and middle fingers. A freely movable appendix may be delivered with the index finger alone. Gross pathology was evident in 30 per cent of the appendices thus removed. He does not advise this route in acute appendicitis.

Neill (70) describes Cullen's method of exposing a retrocæcal and densely adherent appendix. The base of the appendix can usually be located. When this is accomplished blunt forceps are pushed through the meso-appendix at this point and a tape drawn through. Traction upon the ends of the tape brings up from three-fourths to one inch more of the appendix. Another tape is inserted as before and this maneuver repeated until the appendix tip is delivered. Usually three tapes are sufficient. The meso-appendix is clamped off and the remainder of the operation carried out according to indications.

White (71) reports a case of appendicitis, drained with a rubber tube, in which an active hæmorrhage began four days after operation and continued twenty-four hours, although packing was tightly inserted about the tube. He believes that the hæmorrhage was produced by erosion of the deep epigastric artery by the drainage tube. Fatal hæmorrhage has occurred from this source. The artery is frequently exposed, with its companion veins, in the incision. White applies two ligatures about one inch apart to these vessels in the lower angle of the incision. Free anastomosis insures adequate blood supply. He believes that ligation should be routine in this class of cases.

Pettit (72) describes a method of drainage through the McBurney incision. The drainage tubes lie close to the ilium at the outer end of the split in the internal oblique and transversalis. These muscles are then sutured to the tubes. A

slit is made in the external oblique close to the ilium and the tubes are drawn through. Finally, they are brought out through a corresponding small skin incision close to the anterior superior spine. The drainage canal is thus placed between the cæcum and the bony wall of the pelvis. Primary union of the operative incision is facilitated.

Benjamin (73) deprecates the practice of leaving the raw appendix stump uncovered, as adhesions are invited. Nature must cover it over with tissue or exudate.

Carter (74) describes his method of disposing of the appendix stump as follows: The appendix is clamped near the base and cut off. The suture is threaded on a round needle. The needle is inserted into the cæcum about one-fourth inch from the stump and emerges about one-fourth inch beyond, parallel with the base of the appendix. Repeating this maneuver twice more surrounds the stump with a triangular stitch. An assistant inverts the stump into the bowel and the suture is tied. A few reinforcing Lembert sutures may be inserted.

The Mayo (75) appendectomy, so beautifully demonstrated by the stereoclinic of Kelly, is probably the best-known method. The writer expresses continued confidence in a procedure which he has previously described.

## COMPLICATIONS

As a complication of appendicitis, Delatour (77) reports seven cases of pelvic abscess following the Fowler position. The patient does well for a time, although there is persistent slight elevation of temperature. The incision has ceased to drain and the patient may be allowed to go home with a temperature slightly above normal. Others suddenly recover. Delatour believes that all these cases have undetected pelvic abscesses of comparatively slight virulence. Sudden recovery is due to rupture of the abscess into the rectum. In this series the abscess was disclosed by rectal examination. Treatment consisted in incision per rectum, unless the abscess was located high up, in which event it was aspirated.

Babler (78) believes that pyelephlebitis with multiple abscesses of the lung or liver is a more frequent complication of appendicitis than is realized. In a typical case the diagnosis rests on: (1) the history, showing that the appendix was the primary seat of trouble; (2) the shifting of the symptoms from the appendix to the hepatic region; (3) the progressive increase in the severity and character of the symptoms; (4) the



repeated chills followed by high pulse-rate and marked elevation of body temperature; (5) the jaundice; (6) the persistent pain in the hepatic region; (7) the urinary and blood findings; (8) the change of liver dullness; (9) the picture of marked toxæmia; and (10) the absence of the signs and manifestations of extensive peritonitis. Multiple abscess of the lung is indicated by repeated chills, septic temperature, and persistent cough. The only hope of relief lies in locating and draining the abscesses. Babler reports three cases, two were abscesses in the liver, one of the lung. All were fatal.

Markoe (79) quotes Deaver (80) as follows: "The earlier the operation (for appendicitis during pregnancy), the less the likelihood of infection of the right tube and ovary and the less likely, therefore, the development of serious complications. I have never had abortion occur in pregnant women upon whom I have operated for acute appendicitis, unless the right uterine appendages were involved in the disease, and seldom then." Markoe believes that abortion in these cases is caused by undue handling of the uterus and adnexa. He reports two cases. Case 1. Age 23, I-para, had had acute pain in the appendiceal region for some time. Examination revealed a five month's pregnancy; there was acute pain a little above McBurney's point and some rigidity of the right rectus. Incision was made at McBurney's point. The appendix was found to be adherent to the ascending colon. The greatest care was taken that the uterus, fallopian tube, and ovary were not injured or manipulated, they being held to one side with a pad wet with normal salt solution. The appendix was removed. The patient made an uneventful recovery and four months later was delivered at full term. Case 2. The patient was suffering severely, with marked rigidity, temperature  $101^{\circ}$  F., a white cell count of 16,000 and polynuclears 87. Immediate operation was advised and the advice accepted. A median incision was made from the umbilicus to the symphysis. The omentum extended down over the right tube and ovary, being firmly adherent to the uterus. The omentum was tied off, then the appendix, which was embedded in this mass, was tied off and the stump buried. This left a mass consisting of a piece of omentum, right tube, ovary, and appendix attached to the uterus and right broad ligament. The right tube was very gently tied off and cut away, and the adhesions which held the appendix, omentum, and ovary were then removed from the uterus. Stab wound drainage was provided. The patient aborted with a 4.5

months' foetus, within twelve hours of operation. Otherwise her recovery was uneventful. Markoe states that the appendix is not drawn up into the abdominal cavity by pregnancy, but on the contrary, may be brought up with difficulty into the incision.

Wallace (81) reports a case of ruptured appendix at full-term pregnancy as follows: The patient called him at night for supposed labor pains. He found her sitting up and complaining of severe pain low down on the right side. There was slight cervical dilatation. The head was not engaged. The next afternoon she was still in pain and had been continuously. Temperature  $103.6^{\circ}$  F., pulse 128. Vaginal examination revealed no increase of dilatation, but signs of abscess in the appendix region. An ice-cap was applied in the hope that operation could be delayed until after delivery. The next day the temperature was  $104^{\circ}$  F., pulse 140. Appendectomy was performed and the abscess drained. The incision was closed with exceptional care about the drains in order to withstand the severe strain of labor. Closure was difficult and he believes would have been impossible had he not incised the fascia transversely. The next day, after one and one-half hours of labor, a normal delivery was accomplished under anæsthesia. Recovery was uneventful. The dislocation of McBurney's point in the pregnant abdomen was noticeable. It was difficult to determine where to make the incision.

#### SEQUELA

Bunts (82) reports an interesting sequela of appendectomy. The patient was a nurse who had had a clean appendectomy performed several years previously. She was free from discomfort for nearly a year after operation when she again complained of pain in the right side. The attacks were very severe. Examination revealed a somewhat enlarged ovary. At operation the right ovary was found slightly enlarged and cystic. At the site of the former purse-string suture on the cæcum was a white ring which formed the base of a conical projection of the bowel about one inch in length. Fearing the possibility of rupture of this thin-walled diverticulum and that distention of it might cause colic, Bunts invaginated the protrusion into the cæcum and secured it with a double purse-string suture. There has been no recurrence of pain. He has since found the same condition in two other cases, but in lesser degree. In all three cases the right ovary was abnormal and might have accounted for the pain of which they all

complained. He believes the condition to be not uncommon and that future observation will prove it to be responsible for recurring pain in the right side after appendectomy.

Case (83) states that a common cause of caecal stasis is adhesions, usually associated with disease of the appendix. Immediately following recovery from appendectomy there is usually considerable caecal stasis. Following the attempt to expel the barium enema, it is seen that the caecum has failed to contract, the peristaltic waves which evacuate the large bowel commencing at or above the ileocaecal junction instead of at the tip of the caecum. Even several years after operation caecal stasis persists in many cases, a round residue of barium the size of a 25-cent piece remaining in the caecum after the colon is otherwise emptied of barium. This is especially likely to occur where the patient complains of a tenderness of the caecum. Sometimes this caecal stasis was present before the operation, but often exists after operation where it did not exist before. He believes that the rounded barium occurs at the site of the stump of the appendix and that it has some relation to the invaginating suture by which the stump is buried. This suggests the desirability of including the least possible amount of caecal muscularis in the suture.

In a series of 276 cases of intestinal obstruction reviewed by McGlannan (84), 63 were post-operative. Nearly 40 per cent of the post-operative obstructions and 10 per cent of all cases in this series followed drainage operations for appendicitis. This is a potent argument in favor of early operation at a time when no drainage is required. Had these patients been operated upon early, all would have been spared a second operation, as a result of which 9 died. Prompt operation in appendicitis and careful covering of surfaces in all abdominal operations will afford efficient prophylaxis against post-operative obstruction.

In a series of cases of acute intestinal obstruction reported by Deaver and Ross (85), 81 were due to post-operative adhesions. Fifty-one cases followed operations for appendicitis and 44 were drained at the original operation; 27 died.

#### PROGNOSIS

The prognostic value of post-operative leucocyte count is discussed by White (86). He states that a secondary peritoneal infection with good resistance shows an early and marked increase of leucocytes and will continue for some time. The leucocyte count is a safe guide as to conditions within the abdomen. In general

peritonitis a constant low or declining leucocytosis denotes a grave prognosis.

Eisner (87) believes that an unusual amount of urobilinogen in the urine during appendicitis indicates a destructive lesion of the appendix.

#### MORTALITY

Turner (88) states that the mortality of appendicitis should be less than 5 per cent. Early operation would decrease the death-rate to 1 or 2 per cent, or it might become practically nil. Appendicitis is not inherently dangerous. The result is a question of degree of peritonitis and the stage of the disease when operated upon. At present over 60 per cent of cases are operated upon when involvement is localized. Ten years ago conditions were reversed.

Kakels (89) believes that the majority of deaths from appendicitis are due to failure in making a diagnosis, the abdominal pain being assigned to other abdominal organs rather than the appendix. Early diagnosis should be easy if we remember the following train of symptoms: sudden, generalized abdominal pain, gradually becoming localized, nausea and vomiting, general abdominal sensitiveness, local rigidity, elevation of temperature, leucocytosis, and rapid pulse.

Murphy (90) makes the startling statement that the mortality of appendicitis in the hospitals of the United States is 10 per cent. This death-rate is due to procrastination. The early symptoms are usually diagnostic, later they are obscure. Early symptoms are no guide to the probable outcome. Pain and temperature may be gone by the second day which may mean resolution or gangrene. A gangrenous appendix produces neither pain nor leucocytosis. The next symptoms are those of general peritonitis. The mortality in childhood is three or four times as high.

#### CONCLUSIONS

1. The incidence of primary carcinoma of the appendix suggests the advisability of routine appendectomy during laparotomy.
2. Infection of the appendix by bacteria carried through the blood stream from a distant focus is an established fact.
3. Typhoid fever and pneumonia, in their early stages, may be difficult to differentiate from acute appendicitis.
4. The chief symptoms of chronic appendicitis may be referred to the epigastrium.
5. Undue retention of barium in the appendix and tenderness of that organ elicited under visualized palpation are roentgen signs of great diagnostic value.



6. Appendicular obliteration is an end-result of inflammatory changes and is itself productive of symptoms.

7. Excepting the frank case of acute appendicitis, diagnostic uncertainty or coincident pathology demand ample incision; hence the right rectus approach.

8. The mortality of appendicitis is too high. Early diagnosis and early operation are essential to low mortality.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

#### OPERATIVE SURGERY AND TECHNIQUE

**Primrose, A.:** The Physics of a Surgical Dressing, with Special Reference to the Harmful Effect of Using Impermeable Material Over Septic Wounds. *Brit. M. J.*, 1916, i, 238.

The author refers to an article by Sir Almroth Wright in which Wright advocates the use of sodium chloride 5 per cent with sodium citrate 0.5 per cent as a solution for moist dressings, these being covered by an impervious covering. The author objects to the use of an impervious covering over moist dressings where drainage is desired. He cites experiments to show that capillary attraction is lessened or made nil when evaporation from part of the dressing is prevented. The experiments were carried out by using flasks containing water, a gauze wick being saturated and placed therein with one end protruding. A crystal of an aniline dye was then placed in the wick. If the flask was uncovered the dye rose in the wick; whereas, if an impermeable substance was placed over the flask the dye did not rise. This objection to Wright's recommendation, says the author, is especially tenable where the wound is an infected one where drainage is greatly to be desired. J. H. SKILES.

**Fisher, H. E.:** Non-adhering Surgical Gauze. *J. Am. M. Ass.*, 1916, lvi, 939.

Fisher has experimented with various materials in the dressing of open wounds. Absorbent cotton, chamois skin, and powders he rejects as unsatisfactory. Gutta-percha and silver foil, if perforated, give fairly good results. Plain surgical gauze is satisfactory, except that it adheres to granulating wounds, a disadvantage which is less troublesome if narrow mesh gauze is used. Medicated gauze he found to have no particular advantage over plain gauze.

He secured the best results from the use of gauze impregnated with paraffin in the following manner: Eight parts of paraffin mixed with two parts of white petrolatum and lanolin is boiled for ten minutes. Then dry-sterilized gauze, in strips, is immersed for ten minutes in the mixture. The gauze is gradually removed and stretched, and allowed to dry in a current of filtered air, which frees the apertures of excess paraffin. In use, one layer or two is placed in direct contact with the wound or raw

surface, and ordinary surgical gauze fluffed is placed above it. This gauze can be changed as frequently as desired and the waxed gauze can be left on for a considerable period. As the wound heals it is lifted off.

The author finds that this method of dressing has the following advantages: (1) It does not adhere to a granulating wound, and can be left on for a considerable period. (2) It causes no pain or discomfort on application or removal. (3) The paraffin is not absorbed, and the gauze does not become matted with secretions and debris. (4) It closely conforms to the surface to which it is applied. (5) It allows adequate drainage of the wound secretions through the meshes. (6) It is easily and quickly sterilized by immersion in absolute grain alcohol. (7) It is of particular value in the treatment of skin-grafts.

ALBERT EHRENFRIED.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Fraser, J., and Bates, H. J.:** The Surgical and Antiseptic Values of Hypochlorous Acid (Eusol). *Edinb. M. J.*, 1916, xvi, 127.

The method of preparation of eusol is as follows: In a quart bottle 27 gm. of dry bleaching powder are placed, 1 liter of water added to this and the mixture shaken. Then 27 gm. of boric acid are added and the bottle filled with water; after standing for a few hours the mixture is filtered. The filtrate is eusol and contains about 0.5 per cent hypochlorous acid.

Gunshot or stab wounds packed with gauze soaked in eusol solution show beginning granulations within 56 hours. The objections made to the use of this solution are the pain it causes, the irritated and soiled condition of the surrounding skin, and the arrest of wound secretion. According to the authors, all of these objections are negligible.

The solution has been used with inestimable benefit in gas gangrene, and in compound fractures complicated by infection, in disintegration of joints, in compound fractures of the skull, in empyema, and after inflammation or wounds of the abdominal cavity, eusol has been of benefit in preventing supuration and arresting infection. A number of cases of acute toxæmia subsequent to wound infection with a gas-producing organism have been treated by intravenous injection of eusol in amounts

varying from 40 to 70 ccm., to which was added sodium chloride in the proportion of 0.85 per cent. With this method of treatment most gratifying results have been obtained. E. K. ARMSTRONG.

**Clinical Report on the Application of Eusol; Report to Medical Research Committee.** *Lancet*, Lond., 1916, cxc, 356.

The Medical Research Committee of the Royal College of Surgery of Edinburgh has presented a very interesting report on the use of eusol in the treatment of wounds. Several cases are cited to illustrate the use of the solution in both aseptic and septic wounds and to illustrate its value in serous and synovial cavities and in inflammatory lesions of various types. They advocate its usefulness in wounds which have become septic after certain operations.

Their general conclusions are that eusol in a great variety of cases has proved to be non-toxic and non-irritating, as well as an efficient antiseptic. The action of eusol depends upon the free hypochlorous acid which is liberated by the eusol. There is also a sufficient quantity of bichloride of calcium to give the solution a slightly alkaline reaction. This feebly alkaline solution can be introduced into wounds or serous cavities with perfect safety. It can even be left in such cavities in quantity without any harmful effect. In lacerated and contused wounds, and in compound fractures, such as are met with in military practice, the committee found it to be the most efficient antiseptic.

It is most efficacious during the period of what might be termed progressive sepsis. Some surgeons have emphasized the benefit of modifying the treatment when sepsis is subsiding or has ceased. The granulations form after a period of two to three days and rapidly cover the surface of the wound. Any tendency to superabundant growth of granulations and consequent delay in healing can be counteracted either by so applying the eusol that the serous discharge is reduced to a minimum and the wound kept dry, or by discontinuing eusol and using other dressings appropriate for healing wounds. In any event the sepsis is by this stage completely under control.

The freedom which can be exercised in the application of eusol, and the rapid action which it has in arresting the sepsis and discharge of an infected wound, led to experiments on the effect of eusol on the blood. Following this, eusol was employed in the treatment of general sepsis toxæmia by intravenous injection.

This method was first made use of by Lorrain Smith, Ritchie, and Rettie, in a case of grave puerperal septicæmia, and the result was the recovery of the patient. They have also applied the treatment in other similar conditions. In several cases toxæmia has been successfully overcome, and although such a result has not been uniformly attained, the safety of the method justifies its being applied in the diseases referred to in their pre-

liminary communication. Intravenous injection has also been applied with success by Captain Fraser and Captain Bates in cases of acute toxæmia secondary to gas gangrene.

Further research is now being carried out on the development of the subject foreshadowed by these investigations.

The lotion is exceedingly inexpensive. The ingredients are procurable anywhere at a slight cost, and the preparation is a very simple process. Eupad powder is composed of equal weights of boric acid and bleaching powder. The boric acid is in sufficient excess to set free the hypochlorous acid in the solution. The bleaching powder should be dry and should contain 28 to 30 per cent available chlorine.

The solution eusol is prepared as follows: Add to 1 liter of water 25 grams of the powder; shake well and allow it to stand an hour, then filter. The clear solution is eusol, and contains about 0.5 per cent hydrochlorous acid. If the bleaching powder is old or not up to the strength given above, use a larger quantity of the powder.

A rough and ready method of preparation is to add one-half ounce of the mixed powder to 1 pint of water; stir or shake and allow the sediment to settle. D. C. BALFOUR.

## ANÆSTHETICS

**Jackson, D. E.: Some Observations on Anæsthesia and Analgesia.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 113.

Jackson calls attention to the fact that for a number of years past, nitrous oxide has been constantly growing in favor as a general anæsthetic and analgesic. This has been made possible mainly, he states, by the introduction of improved methods of administration. The duration of the anæsthesia under nitrous oxide has also progressively increased from an average of only a minute or two up to an average of perhaps ten minutes or longer, and Jackson states that he has been able by an improved method to keep dogs anæsthetized for periods up to five and one-half hours. Quite recently, he states, there has been a slight tendency to avoid the use of nitrous oxide in any prolonged operation (half an hour or more), because it has frequently appeared that the after-effects of prolonged nitrous-oxide anæsthesia were more deleterious than those of ether. He believes that this is mainly due to the use of improper and unscientific methods of administering the nitrous oxide. He maintains that the cost of nitrous oxide by the method which he has made use of, may be reduced to about 30 or 35 cents per hour for the human subject.

GEORGE E. BEILBY.

**Walter, W.: An Apparatus for the Administration of Gas-Oxygen.** *N. Y. M. J.*, 1916, ciii, 352.

A new apparatus is offered which combines simplicity, portability, efficiency, freedom from pres-



sure, addition of humidity, accuracy, the washing of gases, the warming of gases, visual evidence of the ratio between the gases and a provision for re-breathing with or without ether sequence and without the removal of the mask. The gases are passed through warmed water by means of respective tubes and the evidence of the quantity of gas is shown by the levels of the water in these tubes. A table of ratios is placed in view between the gas-tubes and for any given volume of nitrous oxide, as evidenced by the level, the desired percentage of oxygen for that particular level may be read and instantly provided by readjustment of the oxygen valve. The apparatus is illustrated and the technique of its application fully described in the original article.

E. K. ARMSTRONG.

**Aikins, W. H. B.: The Advantages and Risks of Combined Local and General Anæsthesia.** *Canad. Pract. & Rev.*, 1916, xli, 96.

The author limits his discussion of the use of combined local and general anæsthetics to operations about the nose and throat. Hewitt's tabulation of advantages claimed for such a combination are:

1. The elimination of the element of fear, to which a certain number of anæsthetic deaths are due.
2. The production of a somnolent or apathetic condition, which facilitates anæsthesia.
3. The absence of excitement during anæsthetization.
4. A diminution of the amount of the general anæsthetic necessary to produce the necessary relaxation and depth of anæsthesia.
5. The diminution of secretion, especially that of mucus under ether.
6. Lessening of the tendency to vomiting and pulmonary complications.
7. Lessening of the tendency to shock.
8. A longer period of insensibility after the end of the operation, reducing the discomfort and pain.

Adrenalin and cocaine, the only local anæsthetics considered in this article, must be used with great care and discrimination. They should be applied at least one hour before the induction of general anæsthesia.

Many authors are quoted who have observed sudden death follow the injection of cocaine-adrenalin solutions during a chloroform anæsthesia. Dr. Goodman Levy has been able to produce ventricular fibrillation in cats almost at will by injections of adrenalin during chloroform anæsthesia, a phenomenon which has not followed ether anæsthesia. Whether or not the disturbances noted are due to rapid absorption of adrenalin from the sub-mucous tissues or to direct injection into a vein has yet to be determined. But the undoubted risk of using cocaine and adrenalin in combination with general anæsthesia induced either completely or in part by chloroform has been definitely proved. The author concludes with an emphatic protest

against such a combination of local with general anæsthesia.

E. FISCHEL.

**Hanes, G.: Spinal Anæsthesia.** *Louisville Month. J.*, 1916, xxii, 289.

The author bases his discussion upon 26 rectal cases which he has observed. He claims that the advantages of spinal anæsthesia over all other methods are that it causes the most perfect relaxation of the parts which it is possible to obtain and that the patient has less post-operative discomfort. In the discussion of the technique, the usual points are emphasized: the proper type of needle (short, sharp point), an all-glass syringe, the proper point for injection, the upright position of the patient, and the proper strength of solution. He has used novocaine in all his cases, one-half to one and one-half grain solutions being the dose employed.

The operations were for hæmorrhoids, fistulæ, strictures, polypi, ulceration, one colostomy, and three cancers. The colostomy case was not sufficiently anæsthetized with one-half grain novocaine to permit the operation to be completed without the addition of ether. One patient who was operated upon because of a great deal of pain in the rectum was given one and one-half grains of novocaine. Although kept in the upright position, within five minutes respiration had ceased and no evidence of circulation could be observed. Under various stimulants the patient again had good pulse and respiration, but he died within twenty-four hours without regaining consciousness. Post-mortem examination showed marked disease of all the vital organs, which should have been sufficient reason for prohibiting any form of operation. With these two exceptions the author's experience with spinal anæsthesia was completely successful and he is convinced of its superiority in rectal operations.

E. FISCHEL.

**Lewis, B., and Bartels, L.: Caudal Anæsthesia in Genito-urinary Surgery.** *Surg., Gynec. & Obst.*, 1916, xxii, 262.

This is the method of anæsthesia proposed and first used by Laewen, and is based on the use of saline injections into the sacral canal, suggested by Cathlin in 1901. It is a nerve-blocking method of local anæsthesia, applied in the sacral canal, using a combination of novocaine, potassium sulphate, and adrenalin as the local sedative fluid. At the time of the making up of the report the authors had used the method in 85 cases; and with such success that they felt justified in making the report.

This method is to be distinguished from that of spinal anæsthesia in that the solution is not injected into the spinal canal. The spinal canal is separated from the sacral canal by the cuff of dura mater which closes down on the cauda at about the first segment of the sacrum. An injection of fluid, therefore, into the sacral canal does not reach up into the spinal canal. The object of the injection serves to obtund the sensibilities or anæsthetize

the nerves issuing from the anterior sacral foramina that form the sacral plexus. One of the most important nerves of this plexus is the pudic, distributed to the bladder and prostate and other genito-urinary organs. By anæsthetizing this nerve an anæsthetic condition of the organs mentioned is secured.

Directions for preparing the solution are given and the authors' experience with dosage is detailed. It was found preferable to use larger quantities of weaker solution rather than small quantities of stronger solution to obtain the anæsthetic effect. It was found that the pressure-effect of the anæsthetizing fluid was strongly influential in securing success. From 50 to 90 ccm. of the fluid is now being used by the authors.

The method is particularly advantageous in the very debilitated, decrepit, and aged patients who require major work in genito-urinary surgery. Prostatectomies done suprapubically, removal of vesical stones, and cystoscopies in hypersensitive individuals, have all been done with marked success and comfort under this method of anæsthesia.

The technique of the administration is described and illustrated in the original article. Measures for preventing untoward effects, such as introducing the needle into the spinal canal or into a vein, are

described and suggestions given for avoiding such effects.

#### SURGICAL INSTRUMENTS AND APPARATUS

**Bergeron, J. Z.: Pillar-Compression Forceps for Controlling Hæmorrhage Following Tonsillectomy.** *J. Am. M. Ass.*, 1916, lvi, 505.

The forceps devised by the author for compression of the pillars after tonsil enucleation, consist of (1) a handle, (2) a lock, (3) a goose-neck shank, and (4) compression tips. A companion forceps which has a straight shank is also described, the two to be used together; the curved forceps to be applied above and the straight forceps below. The curved forceps are so constructed that the handle lays outside of the mouth, sufficiently to the side to permit work on the other tonsil or the adenoids while the compression continues.

The point of chief importance in applying the forceps is to pass the compression tips to a sufficient distance toward the lateral wall of the throat, so as to include in the bite (1) that portion of the posterior pillar next to the constrictor of the pharynx, (2) the floor of the tonsillar fossa, and (3) that portion of the anterior pillar next to the mucosa of the cheek.

Otto M. Rott.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Gray, H. M. W.: Observations on Gunshot Wounds of the Head.** *Brit. M. J.*, 1916, i, 261.

The principles in the treatment of these wounds as deduced by Gray are as follows: (1) Infected gunshot wounds of the skull and brain require more careful consideration and prompt attention than similar wounds of any other part. (2) Sepsis can best be combated and prevented by early and complete operations. (3) Permanent disability can be prevented in most cases by the systematic removal of foreign material or displaced bone from the surface or substance of the brain whenever these are accessible to legitimate surgery. (4) By these precautions the immediate results in the saving of life and more rapid restoration of function, when possible, are better than those obtained by more conservative procedures.

The presence of any foreign body in the brain may not cause immediate disability but sooner or later the brain is very apt to resent the presence of these bodies and untoward symptoms develop. Fragments of bone, clothing, metal, etc., should therefore be removed as soon as possible after the receipt of the injury. The presence or absence of cerebral or cerebellar symptoms should not, in the average case, deter the operator from the radical treatment of these wounds.

In minor injuries, the lacerated scalp should be excised and sutured. Primary union usually results.

In depressed fractures of the inner table contusion of the brain is almost certain to occur. The dura should be opened in all such cases, even when it is apparently normal, otherwise injuries to the brain substance may be overlooked and scar tissue form which may cause future trouble. Furthermore, the injured brain substance, if allowed to remain untouched, may become infected and cause abscess, encephalitis, or meningitis. When wounds of the blood sinuses are present it is thought advisable to remove depressed fragments of bone for two reasons: (1) Their retention may cause obstruction to the return of blood from some part of the brain or (2) may lead to septic thrombosis.

As to drainage of the brain, as a general rule this should be avoided whenever possible. The presence of definite pus, infected blood-clot, of inaccessible definitely infected foreign bodies, or profuse oozing would indicate drainage. Bacteriological examination of removed substances should be made and if streptococci are found the drainage should be maintained until these disappear from the discharges or become very few in number.

Several points are enumerated by the author: (1) There may be multiple injuries, therefore the whole scalp should be shaved. (2) The force causing the injury usually results in local injury; injury by contre-coup has rarely to be considered. (3) Fracture of the inner table almost always means injury to the brain substance. (4) A complete



operation facilitates repair, gives better immediate results, and tends to prevent troublesome sequelæ more surely than an incomplete one. (5) Death is due in practically all cases to the effect of sepsis on the damaged brain. (6) The aim in all operations should be to remove as much infected material and tissue as is feasible. (7) Foreign bodies act deleteriously in four ways: by direct effect on delicate brain substance, favoring sepsis, interfering with circulation, and causing scar formation. (8) It is highly important to prevent scar-tissue formation, whether on or in the brain. The nature of the injury, the amount of sepsis, the presence or absence of foreign bodies, and the treatment employed have much to do with the amount of scar formation.

The routine of treatment is as follows: On admission the patient's scalp is shaved, the wound thoroughly examined, and two skiagrams taken at right angles to each other, and an exhaustive neurological examination made. An aperient is given and urotropine given. If the brain is exposed operation should be done at once and in no case should operation be postponed longer than two days.

The majority of wounds of the scalp should be excised and the bone beneath carefully examined. If no bone injury is found the wound can usually be sutured and primary union almost always follows.

Depressed fracture demands immediate exploration. Some cases without injury to the external table may have fracture of the internal table, usually suspected from the location of wounds or the clinical findings. Where the dura is normal in appearance and the brain pulsates well it may not be necessary to open the dura. When the dura is muddy-looking, and the brain does not pulsate it should be opened up by means of a crucial incision. The useless brain material will usually exude.

An injury to the dura without foreign body or sepsis requires careful trimming of the dura, the lost tissue being replaced by a piece of aponeurosis and the scalp sutured. Where a foreign body or sepsis accompanies the injury its withdrawal is attempted and drains usually inserted along the track.

Injury to the blood sinuses can often be closed by the application of a small piece of aponeurosis. The opening is carefully cleansed and the small piece of fascia then quickly applied.

Lumbar puncture has given relief from persistent headache in many cases but, ordinarily, no more than 20 ccm. should be withdrawn. J. H. SKILES.

**Cook, F. S.: Bone-Transplantation in Nose Deformities.** *Wis. M. J.*, 1916, xiv, 427.

Three cases are reported in detail where bone deformities were corrected by bone-transplants. The technique is as follows: A curved incision is made at the root of the nose and the skin dissected free clear to the tip. The periosteum is then incised and raised. A piece of rib (ninth) is then inserted,

with its periosteum still attached, and sutured in place. The skin is sutured and the stitches removed on the fourth or fifth day. The author claims very good cosmetic results. J. H. SKILES.

**Mathews, F. S.: Calculi in the Submaxillary Gland and Wharton's Duct.** *Ann. Surg., Phila.*, 1916, lxiii, 140.

This author reports six cases of calculi in the submaxillary gland and in Wharton's duct, which, considering the rarity of the lesion, is an unusually large number. Two of his cases presented the usual symptoms of pain and swelling at intervals, especially at meals, showing the ball-valve action of the stone. In others without a preceding history there suddenly appeared inflammation and swelling in the submaxillary region, accompanied by a high fever not unlike mumps. One case had a hard swelling under the jaw and a ligneous oedema of the tissues of the floor of the mouth. Unless the stone is very small it can be readily palpated bimanually even in the presence of considerable swelling. All of these cases made a complete recovery after the removal of the stone under novocaine anaesthesia through the mouth, either by dilating a sinus or incising the duct over the stone. The presence of multiple stones must not be overlooked, as a second stone frequently exists. GATEWOOD.

**Kazanjian, V. H.: Treatment of Maxillary Fractures.** *Brit. M. J.*, 1916, i, 266.

These fractures are usually compound and the treatment of the wound is very important, but not related especially to the discussion at hand.

The aim is to maintain a comparative immobility of the parts. All the available devices may not be sufficient to affect this condition when much bone destruction is present.

The ordinary case is treated by firm bandage with wiring of the teeth if such is necessary. The care of the mouth is important and antiseptic douches and applications are recommended. The most dreaded complication is hæmorrhage. A slight oozing may be the beginning of a serious hæmorrhage and should be carefully followed up.

J. H. SKILES.

**Cole, P. P., and Bubbs, C. H.: Deformities of the Jaws Resulting from Operation or Injury.** *Brit. M. J.*, 1916, i, 268.

In deformities from operations on the upper jaw conditions may be present which require one or more of the following procedures: (1) an attempt to separate the nasal from the oral cavity; (2) to restore the masticating surface; and (3) to restore the facial contour. The apparatus is usually made of vulcanite and is held in position by aluminum pins.

In simple division of the lower jaw a suitable splint may help in coaptation of the ends. When part of the mandible has been removed the lateral gliding shoes of Aehner are recommended. When

one-half of the mandible is removed a modified Gunning splint may prove useful. J. H. SKILES.

**Weil, R.: The Treatment of Parotid Tumors by Radium.** *J. Am. M. Ass.*, 1915, lxx, 2138.

Although recent literature contains accounts of parotid tumors favorably influenced by radium, yet as these tumors are of different types and no information has been given as to the microscopic structure, definite deductions cannot be drawn as to the particular type or types of parotid tumors which are suitable for radium treatment. The case now reported by Weil has reference to a tumor of this kind of seven years' duration, which was histologically examined and classed as adenoid cystic epithelioma. The general type of the tumor was that which Billroth named cylindroma.

The treatment consisted of the insertion of radium into the tumor for six weeks; at the end of this period it had disappeared and after an interval of almost two years there is no sign of recurrence.

HOLLIS E. POTTER.

**Morestin, H.: Repair of Losses of Frontal Substance by Means of Cartilaginous Transplants** (Réparation des pertes de substance du frontal à l'aide de transplants cartilagineux). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 424.

Morestin reports the operative details of two rather extensive breeches in the frontal regions repaired by cartilaginous transplants. The technique is relatively simple and the results in such cases are constantly favorable. The cartilage is better taken from the subject himself; but it may be borrowed from another operated subject.

In Morestin's first case there was an osseous loss about the size of a five franc piece in the right frontal region between the eyebrows and the root of the nose. After a series of plastic procedures to restore the symmetry of the parts, the breach was finally filled with cartilage taken from another patient.

In the second case where there were also very extensive losses and the right eye had been enucleated, the repairs were effected by material removed from the region of the seventh and eighth costal cartilages of the patient's right side. In both cases excellent results were obtained.

The work is very delicate as it involves reconstruction of the interior part of the upper orbital arcade and the frontal region corresponding to the root of the nose.

W. A. BRENNAN.

**Landry, L. H.: Intracranial Hæmorrhage Due to Traumatic Rupture of Arteria Meningea Media; Report of Six Operated Cases with One Death.** *South M. J.*, 1916, ix, 157.

It is estimated that 90 per cent of meningeal apoplexies prove fatal if unrelieved surgically, while of a large series of operated cases 67 per cent recovered, a percentage which would have been much larger had it been possible to secure intervention before the onset of medullary symp-

toms. All statistics favor operative relief, those of Bergmann being the most convincing, 20 successes in 22 operations. The great majority of extradural hæmorrhages occur in the lateral aspect of the skull, particularly in the temporal region, those of slight degree not causing symptoms of compression. Ashurst found that a clot between the dura and the bone, equaling one-twelfth the capacity of the cranium will produce coma and death in a few hours. The most common source of the bleeding is the torn anterior branch of the middle meningeal artery. Occasionally the hæmorrhage has been sought for on the opposite side, while in reality it was on the same side as the existing cerebral manifestations at the extremities. The author believes that compression of the opposite side accounts for the collateral paralysis.

Usually the patient is so stunned from the injury that a degree of unconsciousness is produced, from which he recovers only to show evidence of cerebral disturbance, headache, possibly vomiting and stupor. This free interval was marked in four of the author's cases but was absent in the first two. In the clinical picture medullary symptoms are invariably present; the blood-pressure is high; pulse slow; respiration is labored, later it is of the Cheyne-Stokes type; and finally the paralytic stage of compression supervenes.

Compression from any cause must be removed, whether from depressed bone, epi- or subdural hæmorrhage. If given proper attention the most terrible injuries of the skull will go on to a good recovery. It is safe to say that in any serious cranial injury in which unconsciousness has been present from the first, subdural bleeding is taking place. In localizing the anterior meningeal artery the method of Kronlein is the most acceptable. At the pterion the artery is found passing forward and this point is located by dropping a perpendicular from the bregma to the middle of the zygoma, then drawing a horizontal line back from the external angular process; at the junction of these two lines is the Sylvian point, the location of the pterion. However, all methods of measurement have lost their importance, as the surgeon of today explores through a large aperture and not by trephining. Usually the injury to the cranial vault is the best guide to the seat of hæmorrhage.

The author advocates immediate exploration and decompression in doubtful cases, as such an operation adds no more risk to life and often prevents a fatal outcome.

E. K. ARMSTRONG.

**Gosset, A.: Cranioplasty by Cartilaginous Flap** (Cranioplastie par volet cartilagineux). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 444.

Gosset reports 15 cases of cranial osseous breeches repaired by cartilaginous flaps. Whereas, Morestin, who is the originator of this method, usually avails himself of several pieces of cartilage in building up and closing the breach, Gosset prefers to use one single piece. He thinks this gives better results in



combating pressure from the brain, and in the prevention of cerebral hernia. W. A. BRENNAN.

**Frazier, C. H.: Types of Hydrocephalus; Their Differentiation and Treatment.** *Am. J. Dis. Child.*, 1916, xi, 95.

The author suggests a new classification, having a physiological background with direct clinical application:

1. *Hydrocephalus obstructivus*.
2. *Hydrocephalus nonabsorptus*.
3. *Hydrocephalus hypersecretivus*.
4. *Hydrocephalus occultus*.

1. In *hydrocephalus obstructivus* there is mechanical obstruction to the natural drainage of the cerebrospinal fluid from one or more ventricles into the subarachnoid space, where the absorption takes place. This obstruction may be due to a congenital defect, such as absence of the aqueduct of Sylvius or, as is more frequently the case, it may be the result of adhesions from a pre-existing inflammatory lesion. If the aqueduct of Sylvius is lacking or closed by adhesions, there will be a dilatation of both the third and the lateral ventricles, while a closure of the foramen of Munro would cause merely an enlargement of the lateral ventricle on the affected side. If, as is often true in cases of high-grade but evenly-distributed hydrocephalus, the passage of the fluid through the foramina of Magendie and Luschka is blocked, there will be a general dilatation in which all the ventricles participate.

2. In *hydrocephalus nonabsorptus* absorption is delayed or defective, as has been proved by the phenolsulphonaphthalein test. Whether the restricted absorption is to be attributed to (1) the cutting off of part of the subarachnoid space by adhesions, (2) a toxic substance in the fluid which prevents its absorption by the venous channels, or (3) whether it is due to an abnormal condition of the agents which transport the fluid to the venous circulation, is still a matter of conjecture.

3. By a process of elimination and by a careful consideration of the normal physiology of the cerebrospinal fluid and of the possible changes under abnormal conditions, the third type, with apparent excessive accumulation of fluid, has been attributed to hypersecretion—*hydrocephalus hypersecretivus*. Since it has been conclusively proved by morphologic and histologic studies of the choroid plexus, by chemical analyses of the fluid, by a study of the effect of choroid extract on the secretion of cerebrospinal fluid, that the cerebrospinal fluid is the secretory product of the choroid gland, it would seem logical to suppose that a pathologic condition of the gland itself or a toxic substance in the fluid coming in contact with the plexus might bring about a hyperactivity of its cells.

4. The author includes in the varieties of hydrocephalus a fourth type, for which the term *hydrocephalus occultus* has been chosen, which though paradoxical, is otherwise appropriate. The con-

dition thus designated occurs usually in children, though occasionally in adults, and is characterized by excess of fluid in the ventricles, basal cisternæ, and sometimes throughout the subarachnoid space, without there necessarily being any increase in the cranial dimensions. Symptomatically, this condition may be more closely allied to tumors, but, from the point of view of treatment, it properly belongs to the problems of hydrocephalus in that the essential feature is an excessive accumulation of cerebrospinal fluid in the subarachnoid space.

The clinical tests may be summarized as follows:

First examinations:

1. Lumbar puncture.
2. Withdrawal of 1 ccm. of cerebrospinal fluid.
3. Attach 2 ccm. record syringe filled with 1 ccm. neutral solution of dye.
4. Withdraw piston until syringe is full.
5. Inject solution slowly into lumbar subarachnoid space.
6. Withdraw needle.
7. Test urine for phenolsulphonaphthalein every five minutes until dye is detected.
8. Estimate the total amount of dye excreted in the first 2-hour specimen of urine.

Second examination on the following day, or after dye is no longer found in the urine:

1. Puncture of the lateral ventricle.
2. Inject 1 ccm. neutral phenolsulphonaphthalein solution.
3. Lumbar puncture; examine for dye every five minutes until dye appears.
4. Test five-minute specimens of urine.
5. Estimate total amount of dye excreted in first two-hour specimen.

6. In calculations, the amount of dye lost by lumbar puncture must be taken into consideration.

The simplest and most effective method of dealing with *hydrocephalus obstructivus* is puncture of the corpus callosum, the Balkenstich of Anton and Bramann.

In the non-absorptive type, greater technical difficulties are encountered. With some reservation, because his technique is in the developmental stage, the author recommends the establishment of a drainage tract into the pleural cavity. When the lesion is due to hypersecretion, he resorts to thyroid feeding.

EDWARD L. CORNELL.

**Remsen, C. M.: The Relation of the Pathological Bases of Hydrocephalus to Its Surgical Alleviation.** *Interst. M. J.*, 1916, xxiii, 89.

The condition leading to the development of hydrocephalus may be primary, as in the congenital type, or secondary to obstructions of the foramina of exit (meningitic adhesions) or of the veins of exit, as in brain tumor.

Trauma, lues, tuberculosis, septic meningitis, brain tumor, and chronic alcoholism may be associated with it, while tubercular meningitis may lead to fatal hydrocephalus.

The author outlines the anatomy and physiology

of the ventricular system, and discusses the sources of origin of the cerebrospinal fluid. By means of experimental blocking off of the ventricular cavities and stimulation of the choroid plexus, the latter have been shown to be the chief origin of the fluid. Likewise, other experiments have shown the egress of the fluid to be chiefly by means of absorption into the arachnoid villi and venous sinuses. Hence, an increase in the cerebrospinal fluid may be due to (1) an overproduction by the choroid plexus; (2) a disturbance of the principal absorptive system—the arachnoid villi and sinuses; or (3) to a mechanical obstruction in the course of its flow from the plexus, through the ventricles and subarachnoid space, to the sinuses.

That certain types of this condition (choroidorrhoea) may be of toxic origin seems probable from the effect of the injection of certain drugs or extracts, since brain, plexus, or pituitary, and also muscarine have a stimulating, thyroid a depressing, effect upon the secretion. As regards pathological conditions producing symptoms of hydrocephalus, the author points out that large posterior fossa tumors are sometimes without signs of increased fluid tension, and that the important sign of choked disk may not be due directly to the tumor itself but to the hydrocephalus, causing infiltration of cerebrospinal fluid along the optic nerve sheaths and compression of the venous return from the retina. In essential hydrocephalus with no pathological obstruction, a vicious circle resulting from excess accumulation of fluid in the cisterna magna pressing on the veins of Galen, which causes increased intracranial pressure and depresses absorptive action, is responsible. Forcing upward of the midbrain and plugging of the tentorial opening may also be a factor.

The practical results of obstructive conditions being a cutting off of the secretory from the absorptive systems, it is unlikely that thyroid extract or other therapeutic substances will be of benefit, and evidently a communication between the systems must be established. The author mentions the various operations devised for this purpose, and recommends the method of von Bramann as the simplest. In this a ventriculostomy is performed by the passage of a blunt cannula by way of the longitudinal fissure and puncture of the distended lateral ventricle. The continual escape of fluid into the subarachnoid space equalizes the pressure and conditions approach normal. This operation is indicated both in hydrocephalus of the obstructive type and in essential choroidorrhoea in infancy, before cerebral destruction has occurred. The technique of the operation is outlined. Failures may be due to closure of the ventriculostomy opening.

HORACE BINNEY.

**Jacob, F. M.: Glioma of the Cerebellum with Metastases.** *J. Med. Research*, 1916, xxxiv, 95.

Jacob reports the case of a young adult giving a typical history of brain tumor extending over a

period of two years. The autopsy showed a large glioma of the cerebellum which had extended into and obliterated the fourth ventricle and occupied most of the central white matter of the cerebellum. Smaller masses of a similar character were distributed upon the ependyma of the lateral ventricle, the central canal of the spinal cord, and the leptomeninges. All of these masses were very cellular, unencapsulated, infiltrating and, to all microscopical appearance, malignant in character. Gland-like and rosette structures were noted in many parts of the tumors. The masses in the ventricle were discrete and had a nodular papillomatous structure, but the pia mater of the cerebrum, cerebellum, and cord contained a patchy growth of gliomatous tissue extending over a considerable area, involving much of the surface of the brain and cord. He found no masses in any organs outside the cranial and spinal cavities.

From his study the author draws the following conclusions:

1. Although gliomata of the brain do not invade blood and lymph channels or form metastases in distant organs, they do form metastases in the brain and cord by means of cerebrospinal fluid. The reason for this, he believes, may be found in the fact that glia cells are highly specialized and cannot grow when removed from their natural surroundings.

2. Even though gliomata of the brain do not metastasize to other organs, many of them, the author thinks, should be considered histologically malignant or at least locally malignant on account of their power of infiltration, rapid rate of growth, and the embryonal character of the cells.

GEORGE E. BEILBY.

**Grey, E. G.: Studies on the Localization of Cerebellar Tumors.** *Ann. Surg.*, Phila., 1916, lxxii, 129.

Notwithstanding the comprehensive literature which pertains to diseases of the posterior cranial fossa, the significance of the position of the head and of suboccipital discomfort still remains uncertain. The author has carefully analyzed the symptoms in 60 certified cases of cerebellar and extracerebellar tumors from Cushing's neurological service in an attempt to determine a consistent relation between the position of the head and the location of the tumor. About 40 per cent of the cases with cerebellar tumor showed some change in the position of the head, while only 7 per cent of the cases with tumors anterior to the cerebellum showed any unusual attitude, and in each of the latter cases the change was slight. The tilting of the head or its rotation in patients with symptoms pointing toward an intracranial tumor is very suggestive of a sub-tentorial new-growth. The attitude has no particular significance in localizing the lesion in one side or the other of the cranial fossa.

Backward retraction of the head occurred in 8 out of the 60 cases and typical opisthotonos attacks appeared in 2 of these cases. As this condition



was not noted in any case of tumor anterior to the cerebellum, backward retraction of the head may be said to be characteristic of new-growths situated below the tentorium.

Atrophy and osteoporosis of the subjacent bone from tumor extension may occasion occipital tenderness in some cases, but comparisons of the clinical and operative findings in this series showed no consistent relations existing between the two.

Headache or pain is the most frequent of the suboccipital discomforts, and was present in some form in 75 per cent of the cases examined. While occipital discomforts occurred to some degree in 33 per cent of 43 cases with tumors anterior to the cerebellum, as a rule, they were much less intense than in the cases with subtentorial new-growths. Taking the series as a whole, no consistent relation has been found between the part of the cranial fossa occupied by the tumor and the site of the discomfort. When unilateral discomfort is present, however, it may be slightly suggestive of the side of the new-growth.

Since suboccipital discomforts were present more than twice as often in patients with posterior cranial fossa lesions as in those with tumors situated elsewhere in the brain, the author concludes that they must be ranked with asynergy as the most important indications in the localization of intracranial new-growths. Posture of the head, while of no value in localization of the side of the lesion, must also be considered as a sign of considerable value in localizing subtentorial tumors.

GATEWOOD.

## NECK

**Winslow, R.: Tumors of the Carotid Body.** *Tr. Am. Surg. Ass.*, Washington, 1916, May.

The author's paper is based upon the report of two cases of this character operated on by A. M. Shipley and himself, respectively, and a somewhat comprehensive review of the subject is given, with a brief summary of the cases that have been reported in the past three years.

Shipley's case was a girl, 16 years old, with a rapidly growing tumor, the size of a hen's egg, on the right side of the neck. This had only been noticed for two months previous to operation. There were no symptoms except the presence of the lump. The tumor, which was situated in the upper carotid triangle, was movable laterally but not vertically. At operation the common carotid artery was found to run through the mass and was ligated above and below and excised. At once the heart action became tumultuous and ran wild for five days, when it gradually returned to normal. The patient was well five years subsequently, without recurrence.

Winslow's case was a man, 24 years of age, who had noticed a lump on the left side of his neck for eight years. The lump gave little or no distress but grew slowly to the size of a hen's egg. The tumor was single, smooth, somewhat movable but also fixed, not painful but somewhat tender on deep pres-

sure. It was situated in the upper carotid triangle on the left side, and was suspected to be a "carotid tumor." When it was exposed by incision it could not be removed until the common and internal carotid arteries were ligated and excised. No cerebral or cardiac disturbance followed the ligation of these vessels, and with the exception of a laryngeal paralysis no complications arose. He made a good recovery and was free from recurrence 18 months later. The tumor was an endothelioma.

In addition to these cases, Winslow reports an unpublished case of bilateral carotid tumor operated on by William Perrin Nicolson, Atlanta, Ga.

A woman, 43 years old, had a very large mass on the left side of the neck, which had only been noticed for nine months. On the right side was a small movable lump that was of only two months' duration. Pressure symptoms were causing distress and the patient clamored for relief. Operation was very difficult, but the growth on the left side was finally isolated and removed after ligation of the common and internal carotid arteries which tunneled the mass. A very severe physiological storm set in immediately with pulse-rate 150, suffusion of the left side of the face and the left eye, aphonia, paralysis of the muscles of deglutition, and bronchorrhoea. These symptoms gradually improved and in three weeks an attempt was made to remove the gland on the opposite side. This was accomplished by dissecting the tumor from the vessels without ligating any of them. The patient recovered from the two operations but died of recurrence in four months.

Tumors of the carotid ganglion are being reported in ever increasing numbers but are still surgical rarities. They occur with equal frequency in males and females and though observed most often from 20 to 60 years of age are also seen at other periods of life.

A single, slow growing, firm, smooth, discrete, usually painless, oval lump, more or less fixed, situated in the upper carotid triangle, opposite the thyroid cartilage and anterior to or under the sternomastoid muscle, should always cause one to suspect a neoplasm of the carotid body.

As these tumors are either potentially or actually malignant the question of treatment is an important matter. The common carotid artery often tunnels the growth, making its removal impossible without ligating and excising the artery with the mass. The pneumogastric nerve also is frequently in such close proximity to the tumor that it is injured, with serious results. In consequence of these, as well as of other facts, operations for the removal of carotid tumors are fraught with danger and the mortality is high. In some cases the growth can be dissected from the vessels without injuring them, but the recurrences are very high.

In 34 cases in which the main vessels were ligated there were 11 deaths, but only 2 or 3 recurrences were noted in those who survived; while in 25 cases in which the tumor was dissected from the arteries only one died, but recurrence occurred in 8 cases.



In the opinion of the author all such cases should be removed, even if it involves the ligation and excision of the carotids, and no attempt should be made to dissect the tumor free from the vessels unless it is only loosely attached to them.

**Leriche: Resection in the Case of Projectile Wounds of the Neck** (Resection dans les plaies du cou par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 416.

Leriche reports the details in the case of four resections of the neck which he has performed owing to injury of the articulation. Two of these were done within a few days after the injury and the other two were done considerably later. Excellent results were obtained in the late cases, but in the other cases there were defects of lateral movement. Ollier's technique was followed.

In submitting Leriche's report, Quénu considers that there are three categories of neck resections: (1) primitive, practiced immediately or in the first days after injury and before there is any infection; (2) early secondary, made within a few weeks of injury; and (3) late secondary, when the acute stage is passed and when only a fistulous trajectory is present or even cicatrization is effected. Quénu thinks that whenever the articulation is involved primitive resection is called for. He reports some cases under each category observed by him with particulars of treatment and results obtained.

W. A. BRENNAN.

**Evans, J. S., Middleton, W. S., and Smith, A. J.: Tonsillar Endamœbiasis and Thyroid Disturbances.** *Am. J. M. Sc.*, 1916, cli, 210.

The authors discuss the etiological rôle played by an endamœbic infection of the tonsils in endemic goiter, and give a summary of the present-day conception of the part that is played by chronic infections in the causation of goiter, quoting the work of McCarrison on endemic goiter in India, his opinion being that one of the etiological factors is infection of the intestines from drinking water. He showed how the boiling or filtering of water rendered it innocuous, whereas the feeding of unboiled water to non-goitrous patients was followed by thyroid enlargement.

Farrant is quoted as advancing the first definite evidence of a specific bacterial agent, proposing the theory and evidence of a mutant colon bacillus in the intestinal tract as an important factor in goiter production through the agency of its toxins. He also quotes Halstead and Billings' views on the part that infections play in the causation of thyroid enlargement.

The authors do not hold that infection is the only factor in goiter, but put forth the idea that it is one of the numerous agencies that may influence the development of the disease.

A statistical study was made at the Medical Clinic of the University of Wisconsin, with reference to coexistent infections of the nose and throat in their association with goiter. Of the 1,328 men

examined, 27.2 per cent had thyroid involvement; of 362 goitrous individuals examined, 90 per cent had nasal and tonsillar infections. In tonsils of 34 cases examined microscopically, 97 per cent were found to have endamœba gingivalis (Gros) in the tonsillar crypts. Of 16 individuals of this group who after treatment by emetin hydrochloride were re-examined, 81 per cent were shown to no longer have the organism in the cryptal contents. In 23 individuals, to whom emetin was administered, a reduction in the bulk of the goiter was appreciable in 18, and in 7 dysthyroid cases included in this group of the cured cases, 6 were benefited in degrees varying from slight amelioration to apparent cure.

Inability to demonstrate endamœba in the thyroid gland renders improbable any direct causal relation of the amœbic infection of the tonsil *per se* upon the development of thyroid disturbances. The improvement, morphologically and symptomatically, in the treated cases leaves little doubt, after ruling out a vasomotor influence from the emetin employed, as to an indirect relationship. A symbiosis of endamœba with appropriate bacteria, leading to the elaboration and absorption into the thyroid of selective thyrotoxic poisons via the blood stream is at least conceivable in explanation of such relation.

In no sense do the authors care to be understood as advancing hereby an exclusive explanation for all goiters. Other types and other locations of infections capable of producing thyrotoxic toxins, perhaps, too, toxic substances having a similar influence but derived from metabolic or alimentary fault, or even entering the body from without, are all of possible influence. Nor is the influence of sympathetic stimulation, however accomplished, to be overlooked. The authors are unable to find, however, in any of these lines of thought, any satisfactory explanation of the known occurrence of belts of endemic goiter along certain well-defined glacial drifts.

HARRY G. SLOAN.

**Koch, W. F.: The Physiology of the Parathyroid Glands.** *J. Lab. & Clin. Med.*, 1916, i, 299.

After a consideration of ductless glands in general and the parathyroids in particular, Koch endeavors to elucidate the obscure mechanism of the activity of these glands.

The behavior of the parathyroidectomized dog may, he says, coincide with either of two distinct types of symptoms, or with a mixture of these types, in which either may predominate. In one type the dominant feature is over-excitability; in the other under-excitability. In the former tonic convulsions are characteristic; in the latter we observe a peculiar muscular flaccidity and a general depression of the nervous system. In either case a pathological condition develops within a few days after removal of the glands and proves fatal within two to ten days.

Up to the present only one fact which contributes



to the explanation of this pathological process has been advanced; it is the discovery by MacCallum that the urines of parathyroidectomized animals contain excessive quantities of calcium; and that when calcium salts are injected intravenously into such animals, the tetany is immediately controlled. It was shown by Beebe and Berkeley that injections of other salts have a similar though not so marked an effect.

Koch recently found that when the tetany had become uncontrollable by injections of aqueous salt solutions, the kidneys had become so pathological as to be unable to functionate normally. Since one of the effects of such intravenous injections is diuretic, it may be assumed that one of the beneficial effects of the aqueous calcium injections depends upon increasing the work of the kidneys and thus the detoxication of the blood. If on the other hand the value of calcium depends upon the increasing or maintaining of a certain reaction of the blood, the acid radicals are here the important factors. They present two possible modes of activity, the simple neutralization of basic substances excessively elaborated within the body or the destruction of such substances as are capable of producing the tetany.

There are then several indications that the tetany of parathyroid insufficiency is due to an intoxication; namely, that it is subdued by increased diuresis, and by the neutralization of toxic basicity, or the destruction of a toxin by acidity. That the origin of the hypothetical toxic substance is the body itself, that it is useful and not toxic in the presence of the parathyroid glands, and that it is filtered through the glomerulus of the kidney, point to a substance hormone-like in nature and therefore very unstable chemically.

In the effort to ascertain the presence and identity of such a substance the urines were collected separately from 47 parathyroidectomized dogs. Especially designed cages were used to avoid faecal contamination. The urines were filtered and evaporated to a syrup by an electric fan at a tem-

perature not above 20° C. The residues were dissolved in alcohol, filtered and evaporated, and this process repeated until the last evaporate dissolved readily in alcohol. The lipoids present were extracted with ether and the residue taken up in water. This solution was cautiously precipitated with picrolonic acid. Several insoluble picrolonates were thus obtained, and by recrystallization from water and alcohol were purified. These substances were tested for physiological activity. Two of them were found to modify the blood-pressure when injected intravenously into anesthetized dogs. When injected intraperitoneally into non-anesthetized animals they exhibited very marked toxic effects. Because of the agreement in chemical and physiological properties he considered the substances identified as methylcyanamide and trimethylmelamine.

Physiological tests were made with methylcyanamide isolated from the urines and the synthetic methylcyanamide; when injected intraperitoneally in non-anesthetized dogs they were found to have similar effects. In small doses they produced extreme vasodilatation, observed in the reddening of the sclera and swelling and reddening of the tongue. Larger doses caused paralysis and convulsions. Still larger doses caused an extremely rapid death.

The author concludes as follows: The similarity in the behavior of the parathyroidectomized dogs, to that of the non-anesthetized animals treated with the substance isolated from the urine, is further indication that this substance is responsible for the symptom-complex of parathyroid insufficiency. The data therefore justify the following conclusions:

1. Somewhere in the body methylcyanamide is generated.
2. This substance has a physiological value in normal animals.
3. After parathyroid extirpation the substance accumulates to toxic quantities, and is responsible for the death of these animals.

ALBERT EHRENFRIED.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Perreau, H.: Penetrating Wounds of the Chest in Warfare.** *Med. Press & Circ.*, 1916, *Cl.*, 100.

A penetrating wound of the chest requires immediate immobilization of the chest. The diagnosis should therefore be made as soon as possible and doubtful cases should be treated by immobilization also, as it can do them no harm and may even expedite healing. The early diagnosis is greatly assisted by the roentgen ray.

The immediate immobilization of the chest is necessary to avoid severe complications. Among these complications may be mentioned: (1) Embolism which may be caused by any sudden movement,

even after a considerable lapse of time, and which may prove rapidly fatal. (2) Pleural effusion is very common and may change to a purulent fluid. (3) Subcutaneous emphysema may occur, either local or more or less general. (4) Bronchopneumonia and hæmorrhage are rare complications. In order to lessen the liability to these complications, immediate, absolute, and prolonged immobilization is necessary.

The conclusions reached by the author are as follows:

1. An early diagnosis should be made by the aid of radiology whenever possible.
2. Immediate, absolute, prolonged immobilization should be ordered.



3. The patients should be kept on a water diet for the first two or three days, not allowing them to raise the head to drink.

4. Such patients should not be transferred until after a fortnight's immobility.

5. During the first four or five days a daily dose of 10 ccm. of camphorated oil should be given.

6. Except when absolutely necessary no attempt should be made to remove intrathoracic projectiles.

7. Prompt, wide opening should be resorted to, to give issue to early copious purulent effusions.

J. H. SKILES.

**Boothby, W. M.: Gunshot Wounds of the Thorax.**  
*Boston M. & S. J.*, clxxiv, 1916, 378.

The author discusses his observations on 21 cases of thoracic injuries out of a total of 441 wounds of all kinds treated in the Harvard Unit. The cases observed fortunately included examples of most of the important thoracic lesions which reach hospital care.

Hæmoptysis was present in nearly all of the cases. In some it was very slight, lasting for a short time; in others it was present for many days. It was more apt to be present when the lesion occurred from the larger and irregularly shaped missiles.

Hæmothorax is a complication which arises from injury to blood-vessels belonging to the general rather than to the pulmonary circulation, such as the intercostals, the internal mammary arteries and veins, and the azygos veins. These vessels are not surrounded by muscular tissue, hence the tendency to hæmorrhage from them. An additional cause of hæmorrhage is due to the fact that the blood shows no greater tendency to clot when it is in contact with the endothelial lining of the pleura than it does when in contact with the endothelium of the blood-vessels. Toeunissen found that at first the fluid was dark red, with a cell count essentially similar to that of blood, but with fewer red cells and a higher percentage of eosinophiles. The fluid had no tendency to clot in the pleural cavity or when withdrawn. When the vessels had finally stopped bleeding the fluid became brighter red, with a decrease in the number of red cells, though the white cells remained the same. The percentage of eosinophiles gradually increased, as much as 70 per cent. The fluid while showing no tendency to clot in the pleural cavity, clotted when withdrawn. During the stage of absorption the fluid became less hæmorrhagic and at times almost entirely serous. At this stage it again lost its clotting power when withdrawn from the pleural cavity.

Penzoldt states that at first the blood is defibrinated, and later as pleuritic irritation develops, an increase in leucocytes occurs with the development of a new blood-clotting substance from the pleural endothelium. When the fluid remains long enough in the pleural cavity this clot-producing substance gradually disappears with the pleural irritation. The presence of the eosinophiles

is due to some local cause as they are not present in increased number in the circulating blood.

Sauerbruch has pointed out that bleeding from lung tissue, or the vessel of the pulmonary circulation, is of short duration. The lung tissue itself seems to possess a hæmostatic action; the early clotting of blood is also favored by the low pressure existing in the pulmonary system of vessels; and, lastly, the vessels of the pulmonary circulation are surrounded by a loose tissue which, on injury, contracts down on the bleeding vessel.

The most important principle in the treatment of hæmorrhage is absolute rest which favors a low blood-pressure and clotting. Since it has been shown that late bleeding is apt to occur in from eight to fourteen days after the injury it is better to allow a period of rest of two weeks to elapse before extended transportation is undertaken.

Out of 84 post-mortems observed by Bradford and Elliott at Boulogne, in which death resulted from chest-wounds, 69 had effusion of blood in the pleural cavity; 23 died of complications like purulent bronchitis, paraplegia, or abdominal lesions; 46 died from hæmothorax, in 38 of which infection was present. Death from hæmorrhage resulted only in one case.

In one group of 168 cases of hæmothorax treated clinically 114 were sterile and 48 had such large effusions that it was necessary to aspirate. Twenty-eight infected effusions survived after resection of rib. Twenty deaths were due to infection.

In a second group of 160 cases, 68 remained sterile, and of these 41 required aspiration, 53 cases were infected and survived resection of rib. Out of 21 deaths 16 were infected. There was one death from simple hæmothorax.

The foregoing statistics show the dangers of infection in hæmothorax. The authors insist on a rest of three days after the receipt of the wound. The patient is then taken as rapidly and comfortably as possible to a place where surgical work may be undertaken with safety.

Aspiration to remove part of the fluid and to thereby hasten absorption should not be delayed unduly since the presence of hæmatoma favors the formation of dense pleuritic adhesions with time. The military surgeon is often prevented from operating with safety in field practice, but whenever he commands his environments for aseptic work the rule of aspirating early rather than late should be practiced. The presence of increased temperature which prompts aspiration is not always the result of sepsis. The rise may be due to absorption of fibrin, and it may be further aggravated by respiratory embarrassment and mental worry. The rule is to aspirate in all cases of irregular temperature and to practice thoracotomy whenever pus is found.

When aspiration becomes necessary the amount of fluid to be withdrawn is a debated point. Sauerbruch believes that this should not exceed 20 to 30 ccm. If too much fluid is removed the intra-



pleural pressure will be lowered and there will be a tendency to recurrent hæmorrhage. In order to avoid this danger it is better to aspirate with a simple aspirating needle to which is connected a rubber tube 30 cm. long, the whole of which is filled with sterile water and the distal end immersed in a basin of sterile water. This method produces a suction equivalent to the difference in the level between the surface of the water in the basin and the level of the needle which may be varied up to 30 cm. This amount of suction can be practiced with safety. The method is less risky than the use of an aspirating bottle and pump with which a negative pressure of considerable amount may be produced by the pump.

In pneumohæmorrhax air present above the level of the liquid generally disappears rapidly unless there is a permanent communication with a bronchus. The latter adds to the danger of sepsis, and when sepsis ensues thoracotomy is in order.

Cardiac injuries are treated by absolute rest and morphia given in sufficient quantities to keep the patient drowsy. Immediate operation is rarely possible under field conditions at the front. The service that preceded the Harvard Unit removed a bullet by operation that lay free in the pericardial cavity. The patient recovered in spite of an empyema following the operation.

All cases with a patent opening in the pleura become infected. The frequency of infection depends largely upon the character of the missile, and the condition of the patient's skin and clothes. Infections are more frequent in proportion to the distance from the front. One observer saw empyema in 3 out of 28 cases; another 2 out of 43 cases. Tuffier saw infections develop most frequently after shell wounds and when a foreign body was lodged.

Some observers point to the resistance of the pleura to infection as shown in repeated instances of infected external wounds leading to the pleural cavity in which the pleural wound closed, thus warding off infection. It is generally agreed that the pleural membrane and the extrapleural fibrous tissue are very resistant to the passage of infection from the extrapleural to the intrapleural surface. Nevertheless care should always be taken not to open the pleura in cases of large septic hæmatomata that develop extrapleurally and which are not connected with the pleural cavity.

When thoracotomy becomes necessary it should be done at the most dependent part of the cavity and the opening should be large enough to admit the hand for thorough exploration and to remove foreign matter. Such a procedure wards off empyema and enables the operator to remove lodged missiles embedded in lung tissue near the surface.

The author concludes his article with the following summary:

1. Intrathoracic hæmorrhage is most likely to cease when the patient is absolutely at rest; therefore he should be kept in bed (under morphia if necessary) at the first available station.

2. Symptoms rapidly developing, suggesting pneumonia with marked dyspnœa, are probably due to the production of a large hæmothorax or a pneumothorax. Such cases should be aspirated and sufficient fluid withdrawn to relieve the dyspnœa. Care should be taken not to produce a negative pressure within the thorax by the use of an aspirating bottle. A simple needle with rubber tube 30 cm. long, filled with sterile water, and the open end immersed in a basin of sterile water, will produce as great a suction as it is safe to use. With such an apparatus as much fluid can be withdrawn as will run out of its own accord.

3. After three days the danger of infection exceeds that of hæmorrhage. Therefore, if the patient is not in a place equipped for diagnosing and operating for empyema, he should be removed to the nearest hospital so equipped, and kept there for at least two weeks.

4. Whenever the patient presents an irregular elevation of temperature, exploratory aspiration with a small hypodermic syringe, armed with a long needle of large bore, should be performed.

5. Whenever the pleural fluid is found infected, a long thoracotomy opening should be made and free drainage instituted.

6. If the patient is in a dangerous condition, prolonged search for the presence of a foreign body should be deferred. However, all foreign matter should be removed as soon as possible in order to hasten the final closing of the wound.

L. A. LAGARDE.

**Herrick, J. F.: Enlarged Thymus in Infancy.**  
*Surg., Gynec. & Obst.*, 1916, xxii, 333.

The symptoms of enlarged thymus may manifest themselves within a week after birth. The symptoms are very similar to those of a foreign body in the air passages. The respiratory difficulty may manifest itself in all possible grades, from a mild stridor to very severe dyspnœa with fatal termination. The symptoms may be the result of pressure on the trachea, on the large vessels, or on the right auricle as appeared in one of the following cases. The diagnosis is aided by more gradual onset, increasing trouble, absence of X-ray evidence of foreign body, with X-ray shadow of enlarged gland, broadened sternal dullness, negative laryngoscopic findings, and failure of intubation to relieve. The child is usually well nourished but the complexion is usually pale and pasty. There is no disturbance of pulse or temperature. The treatment may be surgical or X-ray. The former is at times followed by death. The latter is safe and effective.

Six cases are reported: Case 1, aged 1 year, died under anæsthesia, in an effort to locate a foreign body. Autopsy revealed a very large thymus overlying the right auricle; no foreign body present. Case 2, aged 3 years 7 months; symptoms present since the child was 3 years of age. The child died suddenly without treatment. Case 3, aged 6 months; symptoms began when child was ten weeks

old. Symptomatic treatment only was given. The child was living but in a serious condition when 10 months of age. Case 4, aged 4 weeks; symptoms present since two weeks of age, attacks very severe. Treatment with X-ray was followed by recovery. Case 5, aged 8 months; symptoms present since first week after birth. Treatment by X-ray; recovery. Case 6, aged 2 months; symptoms present since first week of life. Treatment by X-ray; recovery.

### TRACHEA AND LUNGS

Villeon, P. de la: **The Surgical Extraction of Intrapulmonary Projectiles, Superficial and Deep, Under the Screen, by Simple, Rapid, and Certain Means** (L'extraction opératoire des projectiles intrapulmonaires, superficiels et profonds, sous l'écran, par un procédé simple, rapide et sûr). *Bull. Acad. de méd., Par.*, 1916, lxxv, 275.

Thoracopneumotomy for the extraction of intrapulmonary projectiles has been practiced by the author with uniform success.

He also uses a method much simpler and more rapid, which was carried out successfully in 29 cases.

The principles of this new procedure are based on the method for using the radioscopic screen for the extraction of intrapulmonary projectiles, which was originated by Mauclaire. Villeon's technique is different from that of Mauclaire in that it allows of the extraction of deep as well as superficial projectiles.

The projectile being located by X-ray, the anesthetized patient is placed under the screen, in a dorsal or abdominal position, according to the nearness of the projectile to the anterior or posterior surface of the lung. The projectile makes a shadow on a point of the thoracic parieties. Two or three finger-breadths away, in the intercostal space, by means of a tenotome or a fine blade, a narrow 5-mm. buttonhole incision is made in the skin. Through this incision is introduced a closed forceps (long Pean, long Kocher) or an old style forceps for the extraction of bullets. This forceps passes with difficulty into the narrow buttonhole incision, and following a line oblique to the normal of projection, leads directly to the projectile. It turns aside before it the intercostal fibers, grazes the upper border of the inferior rib (to avoid wounding the vessels), and always closed, goes through the parietal pleura, then the visceral pleura; it then enters the parenchyma where by a gentle handling it is pushed up to the projectile and touches it.

At this moment, the X-ray operator intervenes for the second time, to ascertain whether the forceps is in the right place, if not, to correct the direction. The forceps touches the projectile and mobilizes it. The forceps then opens gently, catches the fragment and extracts it as the opening through which the forceps enters the skin incision is very small, on withdrawal not a particle of air enters; hence no pneumothorax results. The operation lasts but a few minutes, frequently only a few seconds; in difficult cases, 5 to 7 minutes; in simple or typical cases, 40 to 60 seconds. With one suture the button-hole incision is hermetically closed immediately after the regular dressing is applied. The patient is returned to bed, and receives a hypodermic injection of 0.02 cg. of morphine, to avoid excitement upon awakening, and to insure respiratory quiet. In cases of large projectiles, the skin incision is enlarged only when the forceps with the projectile in its blades reaches the skin opening, which can be enlarged as required.

In cases of deep projectiles (8 to 12 cm.), the author employs an old model, long bullet forceps.

This sort of instrumentation has given satisfactory results in 16 cases, and only in a very few cases did any air enter the pleural cavity, or slight subcutaneous emphysema result, incidents without consequence, all of which the author hopes to avoid in the future by using a forceps (on the style of Grunwal's) which he is now constructing.

It sometimes occurs that when the lung is free of all attachments, the forceps does not penetrate the parenchyma at the first attempt, which occurrence permits of invagination and depression. Slight force may be safely used on the visceral pleura in order to enter the parenchyma. The organ resumes its normal shape and the seizing is easily done. The post-operative sequelæ are of extreme simplicity. Slight blood expectorations for two or three days thereafter are of no importance.

The day following the operation, the patient may sit up in bed. The author's patients left the hospital on the fourth day; in a few serious cases on the eighth day. All cases were devoid of post-operative pyrexia. The fever curve remained at 37°C. All symptoms disappeared in four weeks.

The author never uses costal resection and never has been troubled with pneumo- or hæmothorax.

This technique has been used by the author in 16 cases, withdrawing 17 projectiles: 9 superficial, 8 deep (6, 8, 10, 12 cm. deep); 6 in fixed lung, 11 in free lung.

RAOUL L. VIOBAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

Wallace, C.: **Tabular Statement of 500 Abdominal Gunshot Injuries.** *Lancet, Lond.*, 1916, cxc, 502.

Wallace gives a very interesting tabulation of 511 abdominal gunshot injuries. The table which is a

large one shows the nature of the operations performed, and the character of the lesions encountered. The cases were brought to two field hospitals devoted to the care of abdominal wounds, which were well advanced to within 5,000 yards of the fighting line. Like all statistics gathered so near the front,



the mortality appears greater than one is apt to observe further away on the line of communication. The principal facts obtained may be summarized as follows:

Total number of cases.....	511	
Arrived moribund.....	145	
Total mortality excluding the moribund.....	45.8	per cent
Total mortality including the moribund.....	61.25	per cent
Considered with view to operation.....	366	
No operation considered advisable.....	56	
Total operative mortality.....	53.9	per cent
Total hollow viscera mortality.....	64.5	per cent
Stomach (uncomplicated) mortality.....	43.75	per cent
Small gut (uncomplicated) mortality.....	63.8	per cent
Great gut (uncomplicated) mortality.....	60	per cent

The next table gives approximately the number of times the viscera were injured, the unoperated cases not being included.

	Alone of Hollow Viscera	With Other Hollow Viscera	Total
Stomach.....	16	7	23
Small gut.....	69	21	90
Great gut.....	61	12	73
Liver*.....	..	..	48
Spleen.....	..	..	11
Kidney.....	..	..	13
Bladder.....	..	..	13
Ureter.....	..	..	3
Pancreas.....	..	..	1

\* To the 48 cases another 15 cases should be added in which the liver was almost certainly injured, but in which no operation was performed.

In the small gut, resection has a higher mortality than suture, but this is doubtless due to greater initial injury among the resected cases. The actual junction line, in the resected cases, rarely gave trouble. Three cases of obstruction were due to non-toxic paralysis. Resection is to be used instead of suture when the saving of time is an object. Contused edges were found to heal well and without slough, after suture. The soldier's small intestine is usually empty — the converse is true of the large gut.

Of 23 stomach wounds only 11 were uncomplicated by other lesions; the anterior wall was most often involved; anteroposterior wounds were not commonly found; extravasation of stomach contents was fairly frequent, depending on the time of the last meal.

Of 7 fatal cases of stomach injury, uncomplicated by wounds of other hollow viscera, 4 died as a result of primary hæmorrhage. The author dwells on the seriousness of wounds of the epigastric region, and he favors operation in all cases.

The absence of injury to the spleen in stomach injuries was notable and it suggests that such injuries seldom live to reach surgical care.

In the large intestine, the mortality was 60 per cent as a result of peritonitis or, perhaps more frequently, septic infiltration of the retroperitoneal tissue. Wounds of the transverse colon are more apt to be multiple than those of the other divisions of this gut.

Considering the extent of the injury, the wounds of the great gut are much more fatal than those of the small gut, no doubt due to the greater toxicity of the great gut contents.

Most of the injuries of the liver were explored for

hæmorrhage. A good many cases might have recovered without operation.

It is suggested that a good many spleen cases recover spontaneously and that it is only when the vessels are torn that bleeding is excessive. The kidney and spleen seem to be not uncommonly injured at the same time, while the stomach nearly always escapes.

L. A. LAGARDE.

Walker, M. H., Jr., and Ferguson, L. M.: **Peritoneal Adhesions; Their Prevention with Citrate Solutions.** *Ann. Surg.*, Phila., 1916, lxiii, 198.

The authors have performed more than 100 experiments upon rabbits with the idea of discovering the exact effect of hypertonic solutions of sodium citrate and sodium chloride upon the peritoneum and upon peritoneal adhesions. By careful histological examination of sections made of adhesions taken from one to fifteen days after operation, they find the pathology of adhesion formation is simply the process of healing as found wherever tissue has been destroyed.

First, an inflammatory exudate of serum and blood is poured out and quickly coagulates. This exudate is composed of fibrin with a few red and white blood-cells in its meshes. The adherent fibrinous exudate is the framework upon which the fibrous adhesions are built. Within 48 hours the connective tissue and endothelial cells at the base of the adhesion begin to proliferate. Fibroblasts and new blood-vessels appear very rapidly until, at the end of a week, the adhesion is made up of a fairly dense fibrous tissue, containing a moderate amount of blood-vessels with no inflammatory exudate. As time goes on the vessels become less numerous and the fibers of the adhesion appear to reach in among the muscle-bundles of the muscle-coat of the bowel, or of the abdominal wall, as the case may be. Meanwhile the endothelial cells of the peritoneum have proliferated and covered the abdominal surface of the adhesion. The final appearance of the adhesion is simply that of a dense scar-tissue band covered with peritoneum.

As the result of their experiments the authors conclude that hypertonic citrate solutions do, under certain conditions, prevent peritoneal adhesions after laparotomy. The best solution is sodium citrate 3 per cent and sodium chloride 1 per cent. Theoretically in human surgery, after clean laparotomies, a sufficient amount of solution should be introduced into the abdomen to bathe the whole peritoneum (500 to 600 ccm.) and smaller amounts would be of little value.

The authors have not used the solution in human surgery and suggest that the question of shock must be considered and determined by actual tests in the operating room. They believe that if gauze packs, used to wall off the intestines, are wet in citrate solution, much fewer adhesions will result. Adhesions cannot be prevented in the presence of infection by any known method. Large areas of denuded

peritoneum should be covered by plastic operations, for the larger the denuded areas left, the greater the likelihood of adhesion formation. Iodine should be used with great care as very little, if allowed to touch the bowel, causes masses of adhesions. Dry gauze should not be used inside the abdomen.

GATEWOOD.

**Pope, S.: The Prevention of Peritoneal Adhesions by the Use of Citrate Solution.** *Ann. Surg.*, Phila., 1916, lxiii, 205.

Two years ago, the author advocated the use of sodium citrate with sodium chloride in solution for the prevention of peritoneal adhesions. His reasons were based upon experimental work done upon rabbits. Since that time, with Wallace Terry, he has used a solution of citrate of soda 2 per cent with sodium chloride 2 per cent in some 400 abdominal sections. In about 20 cases from four ounces to a pint of this solution was left in the abdominal cavity. In the other cases, the gauze pads and sponges were moistened with the solution. There is no evidence to show that the liability to infection is increased by this treatment, but, on the contrary, where peritonitis is present, a marked improvement seems to have occurred. The quantity of solution was left in the abdominal cavity of such cases as general post-operative adhesions, acute obstructions, pus-tubes, colectomies, resections, and tuberculous peritonitis. The abdominal wounds show more oozing during closure in these cases, but in no case was there evidence of post-operative hæmorrhage or failure of union. This procedure causes pain and partially rouses the patient, so that it has been found expedient to have the incision almost closed before introducing the liquid. Ten of their cases have been reopened so that the benefits could be judged by inspection. The purpose of the citrate is to abolish excessive fibrin deposit with subsequent adhesion formation as it will not prevent inflammatory repair.

GATEWOOD.

**Bayne-Jones, S.: Eventration of the Diaphragm, with Report of a Case of Right-sided Eventration.** *Arch. Int. Med.*, 1916, xvii, 221.

The author reports a case of eventration of the right side of the diaphragm. This diagnosis, made from physical examination, was the first of its kind determined during the life of the patient. The clinical impression was confirmed at operation.

The author has collected from the literature 45 cases of eventration of the diaphragm. Of these, 3 were right-sided and 42 were left-sided lesions.

In the differential diagnosis between eventration and allied states, the author points out difficulties, particularly with regard to the differentiation from hernia of the diaphragm. He believes that no single method is capable of establishing this differentiation, but the combined methods render the diagnosis reasonably certain.

He summarizes the various etiological hypotheses,

showing that the weight of evidence is in favor of the opinion that the disease has a congenital origin.

GEORGE E. BEILBY.

### GASTRO-INTESTINAL TRACT

**Dewis, J. W.: Aids in the Diagnosis of Surgical Conditions of the Stomach with Especial Reference to the Characteristic X-Ray Appearance of the Syphilitic Hour-Glass in Contrast to Those of Simple Ulcer and Cancer.** *Canad. M. Ass. J.*, 1915, v, 1056.

The author believes that the greatest single aid in detecting cancer of the stomach and in differentiating this from ulcer is the X-ray. It is not easy to differentiate cancer from syphilitic ulcer of the stomach, and even the X-ray may fail to detect cancer near the cardia. In the lower two-thirds of the stomach, the X-ray examination ought to show cancer in every case, if properly done and correctly interpreted; and in the majority of cases it will detect cancer earlier than clinical methods.

On the other hand, to determine whether cancer of the stomach is surgical, and when inoperable, while the X-ray is a valuable aid, the chief means are the ordinary methods and the experience and judgment of the clinician. The author thinks that surgery should be the treatment in all early cancers of the stomach; but that the reverse is true in ulcer of the stomach and duodenum except where there are acute perforated ulcers.

Regarding chronic ulcers, whilst some extreme internists are so convinced of the probability of ulcers healing that they would persist in the medical treatment of practically all ulcers, yet it does not seem likely that an ulcer of the stomach or duodenum with a history of twenty or thirty years' duration can be cured with a month or two of medical treatment of any kind.

Chronic ulcers of the stomach become surgical under these conditions: when there is chronic pyloric obstruction not relieved by medical means; when there is permanent hour-glass contraction; in the cases where pain and distress, sour regurgitations, and intractable dyspepsia do not yield to treatment; and finally when there are severe hæmorrhages.

In syphilis of the stomach the first clue is a history of infection confirmed by the Wassermann test and the X-ray. The X-ray is most valuable in a differentiative test. Pictures of syphilis do not show the moth-eaten appearance of cancer and there is much more involvement of the stomach wall than in simple ulcer. But the characteristic point that differentiates syphilis from cancer and simple ulcer is that in syphilitic hour-glass stomach a long regular isthmus is seen, at each end of which the walls of the stomach rise more or less abruptly or dumb-bell like. This is in contrast to the sharp incision of simple ulcer hour-glass with practically no isthmus; and the picture differs quite as much from the cancer hour-glass with the infiltrated walls of the stomach sloping irregularly away from the constricted portion.

HOLLIS E. POTTER.



**Squires, J. W.: Roentgen-Ray Diagnosis of Gastric Lesions.** *N. Y. M. J.*, 1915, cii, 1227.

For the purpose of roentgen ray study the author divides stomach lesions into two groups. The first includes tumors, chronic ulcers, adhesions, and syphilis, lesions which produce permanent defects in the stomach contour. In the second group are included acute simple ulcers and exogastric lesions or lesions which produce spasmodic stomach defects only. In either class a positive diagnosis cannot be made without the aid of the roentgen ray.

In early carcinoma the radiographic findings are very similar to those in ulcer; and at this stage it is impossible to determine by the X-ray whether or not malignant degeneration has occurred. From an X-ray standpoint, however, the important line of division is not between benignancy and malignancy but to determine whether the lesion has advanced sufficiently to become a surgical case. This stage is determined by the production of permanent defects in the contour, six-hour stasis, and interruption of normal peristalsis. The author emphasizes the importance of careful observation of gastric ulcers in the precancerous stages, as on its early recognition depends successful treatment.

Radiograms are taken immediately after a test meal and every half hour after or even more frequently until sufficient data are obtained. This is followed by fluoroscopic examination.

The diagnosis of gastric carcinoma requires a very careful consideration of the radiographic and fluoroscopic observations. The characteristic findings in order of importance are: (1) filling defects; (2) absence of peristalsis in part involved; (3) mobility; (4) superimposing test; (5) pain at site of filling defect (fluoroscopic); (6) changes in the pylorus; (7) residue; and (8) advanced position of test-meal in six hours.

The filling defect is the most valuable as it is constant and is not affected by stomach peristalsis.

The various characteristic findings are shown in illustrations accompanying the article.

The diagnosis of gastric ulcer is similarly based on radiography and fluoroscopy. In the case of chronic ulcer the following signs are basic: (1) permanent irregularities in contour of stomach or cap; (2) interruption of peristaltic contractions; (3) incisure; and (4) locating pain directly over defect (fluoroscopic).

HOLLIS E. POTTER.

**Palmer, C. L.: The Significance of Certain Roentgenographic Findings in the Gastro-intestinal Tract.** *J. Am. M. Ass.*, 1916, lvi, 493.

Normally the stomach can change its position without the help of alteration in body posture. When this mobility of the stomach is lacking, it is either due to restraining forces which prevent the movement, or else to lack of power to move. The former is the most frequent cause for lack of change of position of the stomach.

Persistent supraposed stomach is due to a re-

straint and not to lack of power. This restraint is most frequently exercised by adhesions due chiefly to cholecystitis, chronic appendicitis, traumatism (previous operation), or gastritis due to syphilis, cancer, or ulcer.

Persistent infraposed stomach is not as frequent as supraposed stomach. It is caused by restraint or lack of power to move, most frequently lack of power, which is the case in chronic gastro-enteroptosis with relaxation of the abdominal walls.

Long retention of the gastric contents (twenty-four hours or longer) is chiefly due to one cause, namely, cancer of the stomach. The other chief cause is long-standing chronic cholecystitis. Retention for a shorter time (six to twenty-four hours) has for its most frequent causes cicatricial contraction of the pylorus due to healed ulcers, chronic appendicitis, chronic cholecystitis, typhlitis, and syphilis.

Pylorospasm does exist, but it is not always present when extragastric lesions are prevalent. It probably depends on the reflex excitability of the individual's nervous system.

Diagnoses made by judging from the roentgenograms, together with the history of the case and other clinical evidence obtainable, are correct in nearly every case. This was demonstrated in the majority of the cases by subsequent operation or necropsy. In most of the others it was shown with a satisfying degree of probability by the subsequent course of the case.

Roentgenograms have revealed certain facts which can be demonstrated by other means. The most prominent of these are the obstructive lesions which are, as a rule, located either in the pylorus of the stomach or in the region of the cæcum and are usually due to definite conditions.

By the use of the stomach-tube in gastric analysis, faecal examinations, the charcoal test, Bastedo's test, and careful analysis of clinical symptoms and physical signs, it is possible, in a certain number of cases, to make a very accurate diagnosis without the use of the ray. In all cases which are readily diagnosed without the ray, however, roentgenograms should be taken and carefully interpreted along with laboratory tests, clinical history, and physical findings, in order to obtain a clear diagnosis.

EDWARD L. CORNELL.

**Mann, F. C.: A Study of the Gastric Ulcers Following Removal of the Adrenals.** *J. Exp. Med.*, 1916, xxiii, 203.

Mann noted at autopsy that animals dying after the removal of both adrenals showed acute ulceration of the gastric mucosa in a large number of cases, and he states that other investigators have noted similar results. As no lesion of the gastric mucosa was found at autopsy in a series of more than 200 practically normal animals, it seemed to the author that spontaneous ulcers were not common in these animals. He therefore subjected a large series of animals to adrenalectomy and the results

were studied. The lesions he found in the gastric mucosa after death from adrenal insufficiency consisted of two main types, one a wide-spread, superficial erosion, the other a true, punched-out ulcer formation. The gastric erosions practically always occurred in the fundic division, and in most cases, the author states, the pyloric mucosa appeared normal. The duodenal mucosa was usually congested in the adrenalectomized animals, and in several instances there were definite ulcers. These duodenal ulcers occurred just distal to the pyloric ring and appeared like cauterized areas about 1.5 cm. in diameter. They were deeper at the center than at the edges, penetrating to the muscularis mucosa at the center, and they showed no evidence of hæmorrhage.

To summarize briefly, acute ulcers of the gastric mucosa are found in a large percentage of dogs and cats dying after adrenalectomy. These ulcers seem to develop during the moribund period. They are apparently peptic ulcers forming at the site of local hæmorrhages in the gastric mucosa. They are true acute ulcers, usually penetrating to the muscularis mucosa with a total loss of epithelium. They develop in the absence of pancreatic secretion and bile. However, they appear to develop only in an acid medium.

GEORGE E. BEILBY.

**Friedenwald, J.: The Modern Method of Treatment of Diseases of the Stomach.** *Therap. Gaz.*, 1916, xl, 77.

The treatment of diseases of the stomach was discussed with regard to the use of the stomach-tube, with regard to the diet, to the use of medicinal agents, of mechanical supports, of mineral water cures, and with regard to surgical measures.

Freidenwald classified the indications for operation under three heads, as follows:

1. *Obstructions.* Gastrostomy is indicated in impermeable stricture of the cardiac orifice or of the œsophagus. In benign obstruction of the pylorus, pyloroplasty, gastro-enterostomy, or pylorotomy is indicated. In malignant disease pylorotomy is indicated for cure and gastro-enterostomy for relief.

2. *Gastric ulcer.* The indications for operation are perforation, pyloric obstruction, and ulcers resisting medical cures. The operations indicated are excision of the ulcer, pylorotomy, pyloroplasty, or gastro-enterostomy.

3. *Gastric carcinoma.* An exploratory incision should be urged in all cases over 40 years of age with manifest symptoms of indigestion which are not relieved by a few weeks of medical treatment and in which the diagnosis is still doubtful after a thorough examination.

J. W. TURNER.

**Case, J. T.: Roentgen Studies After Gastric and Intestinal Operations.** *J. Am. M. Ass.*, 1915, lxxv, 1628.

For several years Case has pursued the roentgenologic study of patients after gastric and in-

testinal operations. The results of this study are given under the headings: (1) Acute small bowel obstruction; (2) gastro-enterostomy; (3) appendectomy; and (4) ileocolostomy.

Experience has shown the value of roentgen examination in the diagnosis of post-operative acute small bowel obstruction with special reference to the decision as to the advisability of surgical interference. No barium or opaque meal is usually given, the observations being made by the gas distention of the intestine.

After gastro-enterostomy it has been believed that the rapid exit of food from the stomach was prevented by the formation of rhythmically contracting constriction rings in the duodenum. The author has observed analogous action in a large number of cases in which the ordinary gastrojejunostomy had been performed; viz., a sort of sphincter action established in the jejunum at a point varying from 3 to 6 ccm. below the gastrojejunal opening.

Case says that after gastro-enterostomy there is a stagnation of food in the jejunum near the site of the gastro-enterostomy, due to the inhibition of onward peristaltic activities at this point.

The occurrence of cæcal stasis following appendectomy is very common. Case believes that retention occurs at the site of the stump of the appendix, and that it has some relation to the invaginating suture by which the stump is usually buried.

Most of the cases examined, all in fact except those cases in which an artificial ileocolic valve had been formed, have shown incompetency of the ileocolic stoma permitting an enema to flow back into the small bowel as well as retrogradely around the colon to the cæcum as far as the stump of the colon. In long operated cases especially there is very definite ileal stasis.

From his studies Case states that in a very considerable percentage of cases in which the operation of ileosigmoidostomy is performed for the relief of intestinal stasis, the end-result is infinitely worse than if the patient had not been operated on, at least as far as the stasis is concerned.

HOLLIS E. POTTER.

**Downes, W. A.: Operative Treatment of Pyloric Obstruction in Infants; Review of Sixty-Six Cases.** *Surg., Gynec. & Obst.*, 1916, xxii, 251.

The author reports 66 cases operated upon in five and one-half years. All presented the characteristic symptoms. A tumor was palpated in every case before operation.

The theory best explaining the symptom-complex is that a true malformation is present at birth consisting of an abnormal thickening of the circular muscle of the pylorus, and to this is added an œdematous condition some ten days, or later, after birth. The œdema probably results from the increased activity of the stomach necessary to force an increasing amount of food through the narrowed and elongated pyloric lumen.



Gastro-enterostomy was performed upon 31 of the 66 cases, the remaining 35 being operated on according to the Rammstedt method. Of the 31 cases in which gastro-enterostomy was done there were 11 deaths—a mortality of 35 per cent. Of the 20 discharged as cured, 2 afterwards died of gastro-enteritis and 1 died of diphtheria. The remaining 17 are well and have developed normally. Roentgen-ray examination shows the stomata working satisfactorily, and little or no bismuth passing through the pylorus.

Not satisfied with the results from gastro-enterostomy it was decided to try the partial pyloroplasty of Rammstedt. Consequently, this operation has been done in the last 35 cases. In this series there were 8 deaths, a mortality of 23 per cent. Of the 27 cases discharged as cured, 2 have died since leaving the hospital, the remaining 25 are well extending over a period from a few weeks to one and one-half years. In no case has there been a return of the symptoms.

The cases operated on according to the Rammstedt method vomited less and were easier to feed after operation.

The advantages of the partial pyloroplasty over gastro-enterostomy are: (1) time consumed for operation, the former requiring less than half the time necessary to perform the latter; (2) the operation requires much less surgical skill than gastro-enterostomy; and (3) the continuity of the gastrointestinal tract is preserved. Roentgen-ray examination one and one-half years after operation and autopsy on one case dying three months after operation demonstrates the fact that the stomach functionates normally, and that the tumor entirely disappears after this procedure.

**Jefferson, G.: Ulcer of the Duodenopyloric Fornix.**  
*Ann. Surg., Phila.*, 1916, lxiii, 328.

As is well known, duodenal ulcers have a peculiar partiality for that part of the duodenum immediately adjoining the stomach, and the probable rôle of the gastric juice in the production of these ulcers is obvious. The pylorus when viewed from the duodenum appears as a knoblike projection formed by the massive muscular ring which constitutes the pyloric sphincter. The furrow which surrounds this knob is termed the duodenopyloric fornix. The depth of this sulcus varies considerably, being shallow in relaxed hypotonic stomachs, and especially well marked in duodenal ulcer where gastric hypertonus is the rule. Owing to the absence of valvulae conniventes in the suprapapillary duodenum, the examination of the interior of this part is relatively easy, and it is almost impossible to overlook an ulcer, unless it be situated on the posterior wall and hidden by the projecting pylorus.

The author believes that the duodenopyloric fornix is a frequent site of ulcer, and that ulcers usually classed as "pyloric," a term which suggests gastric origin, are really duodenal. Chronic ulcers of the stomach rarely involve the pyloric canal,

most of them being some distance from the pylorus, while duodenal ulcers become more frequent as the pylorus is approached. The result of ulcer in this location is the destruction of the usual landmarks, making it very difficult to tell the exact point of origin of such an ulcer. Cases are now on record in which the duodenal ulcer has been quite healed, while its invasion of the pylorus has become malignant. The great difference in the frequency of carcinoma following duodenal and gastric ulcer makes differentiation extremely important.

GATEWOOD.

**Bryan, R. C.: Ulcer of the Jejunum.** *Surg., Gynec. & Obst.*, 1916, xxii, 279.

Ulcer of the jejunum is apparently a most rare condition, there being only four cases recorded in the literature which arose *de novo* and independent of a previous gastro-enterostomy. The author's case was that of a man 48 years old, with a history of three years' duration of gastric pain which had been diagnosed as ulcer of the duodenum. He was suddenly taken with severe abdominal pain, followed by collapse; 17 hours later operation was performed. The stomach was bound down, hard, atrophic, pulled to the left and firm. About 3 inches from the duodenojejunal juncture a round punched-out ulcer about the size of a cherry stone was found. The patient died the following morning.

Diagnosis of this condition apparently must be based upon deduction derived from observations of jejunal ulcers forming after a previous gastro-enterostomy. According to the more recent theories these ulcers develop from autodigestion of the mucosa by an acid action which has been poorly modified by the alkaline products of the upper gut.

This has, in a measure, been corroborated by the experimental work of Exalto, Kathe, Wullenstein, and more recently by Soresi of New York. Wilkie has done some interesting experimental work on dogs in which he performed gastro-enterostomies administering various amounts of hydrochloric acid, thus noticing the development of jejunal ulceration. The author is not certain but that there is an association of this condition also with the state "linitis plastica," the gastro-intestinals clerostenosis of Krompecher. In appropriate cases excision, resection, or enterectomy are apparently the operations of choice.

**Deaver, J. B.: Acute Appendicitis.** *N. Y. M. J.*, 1916, ciii, 241.

Appendicitis is the most common intra-abdominal inflammation and the appendix constitutes the avenue by way of which infection most commonly invades the upper abdomen. There are three peritoneal fossae in relation to the appendix, the ileocolic, the ileocæcal, and the subcæcal, the appendix being occasionally buried in one of the last two, thus explaining why the organ is believed to be absent. The author has never failed to find an appendix in the many cases he has operated upon.



The appendix may be found below and to the outer side of the cæcum, to the outer side of the cæcum and colon, pointing upward and outward, behind the cæcum pointing upward; to the inner side of the cæcum, lying beneath or above the terminal mesentery of the ileum; and pointing downward, occupying the false and even the true pelvis. Thus the location of the point of tenderness and of referred pain must differ in particular cases, and symptoms pointing to gall-bladder, duodenal, pyloric, pancreatic, or pelvic disease may arise.

The etiological factors of importance are: age, previous attacks of appendicitis, catarrhal conditions of the gastro-intestinal canal, infectious diseases, especially influenza, and digestive disturbances, the latter resulting in a great increase in the bacterial flora of the intestine.

The peritoneum defends itself by the function of exudation and absorption, the former enabling it to form adhesion of a protective character, and any treatment that breaks down these adhesions, such as purgation, defeats that protective function and may be harmful in the extreme.

Appendicular abscesses are met with in several situations: (1) in front of, below, and to the outer side of the cæcum, the pus being confined by the cæcum, small bowel, omentum, etc.; (2) to the outer side of the cæcum and ascending colon or behind the cæcum in the layers of the mesocolon; (3) in the pelvis; (4) near the median line to the median side of the cæcum; (5) free in the abdominal cavity or existing in the shape of many pockets between the coils of intestines. In addition there are seen secondary abscesses, which occur close to the original abscess, residual abscesses occurring at the site of the primary abscess, and metastatic abscesses, which occur at any point distal to the site of the original, or as a parotid abscess, pyelophlebitis, etc.

The clinical history is typical, a previously well individual being seized with acute abdominal pain, first referred to the umbilical or epigastric region and accompanied by vomiting. The pain soon becomes localized to the right iliac fossa and muscular rigidity is noted. If this sequence is interrupted, the diagnosis of acute appendicitis may be doubted. Fever is always present. If the appendix is in the pelvis the pain is likely to be left-sided. Suddenly subsiding pain followed by a chill points to gangrene, while exquisite tenderness denotes the presence of pus. The differentiation of importance lies between acute cholecystitis and appendicitis.

The treatment is comprehended in the following points: (1) examine the patient thoroughly and not through the clothes; (2) give no aperient medicine; (3)  $\frac{1}{12}$  to  $\frac{1}{16}$  grain of morphine will not mask the symptoms and may be safely given when the pain is severe; (4) the diagnosis having been made the proper measure is immediate operation. In the presence of peritonitis and in the absence of operation, set the patient up in bed, give nothing by mouth, place an ice-bag over the tender area, and

institute enteroclysis. Operate in the cases of localized peritonitis where the lesion can be localized and there is peristalsis in the surrounding region of the abdomen. In diffused peritonitis defer operation until the peritonitis becomes a localized one.

E. K. ARMSTRONG.

**Mayo, W. J.: Radical Operation for Cancer of the Rectum and Rectosigmoid.** *Tr. Am. Surg. Ass.*, Washington, 1916, May.

The author discusses (1) operability, (2) operative mortality, (3) operative disability, (4) function following operation, and (5) permanent cure, on the basis of a study of 753 cases of cancer of the rectum and rectosigmoid examined in the Mayo Clinic between January 1, 1893, and December 31, 1915. Of these, 430 were subjected to radical operation.

Six hundred and nineteen cases gave an operability of 53.1 per cent. Radical operation was seldom refused because of the local extent of the disease. Had it been possible to know the extent of the disease previously in some instances, patients would not have been operated on, though many in a very advanced stage were cured. Lymphatic involvement is usually late and in no case was lymphatic extension alone the cause of inoperability. Theoretically, the abdominal cavity should be explored in every case because of the frequency of metastasis in the liver and peritoneal cavity. In very obese patients the posterior Kraske operation in one stage may be wise.

In 430 radical operations the operative mortality was 15.5 per cent. During the last three years, in spite of the fact that 71.8 patients in each 100 were operated on, the mortality has been reduced to 12.5 per cent; it has now been brought to about 10 per cent. In cases in which the disease in the rectum was movable the mortality was under 5 per cent. All patients dying in the hospital are classified as cases of operative mortality, without regard to length of time that death occurred after operation. Necropsy was secured on 95 per cent of patients dying in the hospital. The mortality in any given statistical group is low with low operability; high operability includes cases of advanced disease which greatly increase the mortality. Comparative statistical data of operative mortality means nothing unless the total number of patients examined, whether operated on or not, is taken into consideration.

The causes of operative mortality are: (1) sepsis, 39.8 per cent, usually due to soiling of the operative field with the infected contents of the involved bowel because the rectum had become fixed and the growth had penetrated its walls; (2) nephritis, 13 per cent acute, developing on chronic; (3) metastatic tumors undiscovered on exploration, 10.5 per cent (had the true condition been known operation should have been performed); (4) death from hæmorrhage, 6.5 per cent, in no case immediate, but blood-loss led to exhaustion, sepsis, etc. No case of shock without hæmorrhage. Secondary hæmorrhages were not truly secondary, but rather a continuation of badly



controlled hemorrhages; (5) death due to exhaustion, etc., often some days or weeks after operation.

When aseptic healing took place, patients were discharged from the hospital as early as sixteen days and returned to work in thirty days. Infected wounds healed in from four to twelve weeks but the patients were not able to return to work for three or four months.

The best function followed the tube resection described by Balfour and the C. H. Mayo method of direct end-to-end union. The Wier invagination method gave excellent results when it could be used. In the Gripps operation, although the entire sphincter was removed, the functional results were as a rule excellent. In the majority of cases the radical operation necessitated a colostomy in the abdomen, or a posterior anus more or less uncontrollable. The Mixter midline colostomy proved most satisfactory.

As to permanent cures, of the 430 patients on whom a resection was done, 364 recovered from the operation. Eliminating those who were operated on less than three years ago, 33.3 per cent have lived three years or more, and 28.3 per cent have lived five years or more after the operation. These percentages may be fairly increased to 37.5 and 35.8 per cent, respectively, by subtracting from the mortality figures the normal death-rates for corresponding ages for periods of three and five years, i.e., 4.2 and 7.5 per cent.<sup>1</sup>

#### LIVER, PANCREAS, AND SPLEEN

**Collins, C. U.: Indications for Cholecystectomy and Cholecystostomy.** *Illinois M. J.*, 1916, xxix, 210.

Letters were sent to 147 patients who had recovered from cholecystostomies, asking if they had had any trouble with the gall-bladder or stomach since the operation. In all 102 replies were received: 74 said they had been perfectly well, so far as the gall-bladder and stomach were concerned; 15 complained of some pain in the gall-bladder or stomach, or both, while 13 complained of still having severe pain at times in the region of the gall-bladder or stomach or both.

Conclusions are drawn from 196 cases:

1. The presence or absence of stones in the gall-bladder should not be considered in deciding to remove or leave a gall-bladder. It is entirely a question of infection.

2. An infected gall-bladder had better be removed if there are no contra-indications.

3. The location of a stone in the common duct may be a factor in the decision. If it has caused a recent attack of jaundice, a possible pancreatitis should be considered, and, if present, the gall-bladder should be retained and drained, at least temporarily.

4. An acutely inflamed gall-bladder due to a virulent infection, evidenced by the clinical symptoms, had probably better be retained and drained.

A cholecystostomy is safer in these acute cases than a cholecystectomy. A cholecystectomy may be safely done after the acute symptoms have subsided, if it is necessary.

5. The small proportion of gall-bladders which contain stones with no present evidence of infection may be drained, although it may be safe in these to open the gall-bladder, remove the stones, and close it without drainage.

6. The general condition of the patient may make a simple cholecystostomy the wiser procedure until the general condition improves.

7. The history is not only the largest element in making the diagnosis, but is also of great importance in deciding the question of removing or retaining the gall-bladder. If the history shows persistent symptoms, indicating chronic infection, the gall-bladder had better be removed.

8. In spite of these conclusions it takes the highest surgical judgment to decide, at times, which will give the most ultimate benefit to the patient, the retention or removal of his gall-bladder.

EDWARD L. CORNELL.

**Bazy, M.: End-Results of Entero-biliary Anastomosis** (Resultats éloignés des anastomoses entéro-biliaires). *Bull. Acad. d. méd.*, 1916, lxxv, 35.

Bazy reports two rare operations: (1) hepatico-duodenostomy for obliteration of the common duct at the summit of Vater's ampulla; (2) choledoco-duodenostomy for obliteration of the terminal portion of the common duct. He has only been able to find three similar cases in the literature and little is known of the end-results. Two of these cases were reported by Terrier at the French Surgical Congress, 1908.

In the two cases reported by the author both patients were women and Bazy has been able to trace their history for sixteen months and eight years respectively after operation. In the latter case the woman became pregnant a little more than a year after operation, and was delivered of twins at term without any trouble. In her case the anastomosis has functioned well, and at no time during the past eight years has the integrity of the bile passages or the functioning of the kidneys been menaced.

In the discussion Branet mentioned a similar operation in a case where the lower half of the common duct was almost completely obliterated and the upper half was anastomosed to the duodenum. One year later there was reappearance of icterus with other troubles and the patient died.

A. Goss.

**Mapes, C. C.: Uncertainties of Understanding Anent Cholelithiasis.** *Am. J. Surg.*, 1916, xxx, 54.

The author reaches the following conclusions:

1. That there are many uncertainties of understanding anent the etiology, histopathology, symptomatology, and treatment of cholelithiasis.

2. That the hypothesis that bacterial invasion

<sup>1</sup> Medico-actuarial mortality investigation table.

represents the terminal rather than the primary factor in cholelithiasis has been clearly disproved.

3. That the medicinal treatment of cholelithiasis is a delusion, there being no drug which internally administered will cause disintegration of definitely formed choleliths.

4. That the most favorable results may be expected to accrue from cholecystostomy, cholelithotomy, and temporary drainage.

5. That cholecystectomy is illogical and unwarranted except where the cholecyst is already damaged beyond hope of functional restoration or is involved in demonstrable malignancy.

C. G. HEYD.

**Einhorn, M.: Pancreatic Stone Colic** (Zur Klinik der Pankreassteinkolik). *Berl. klin. Wchnschr.*, 1916, liii, 110.

Pancreatic stones are rarely observed in the human organism and their diagnosis during life is rarer still. Einhorn reports two cases which he has had under his observation.

Of the diagnostic signs the occurrence of colic-like pain in the epigastric region which is associated with a transient appearance of sugar in the urine is the most characteristic. This pain is periodically repeated and its sudden cessation speaks of the passing off of the stone. The appearance of a stone in the faeces consisting chiefly of calcium carbonate without cholesterolin or bile pigment points to its pancreatic origin.

As a general rule the pancreatic function is not disturbed for a long time. Later there are disturbances which lessen the pancreatic activity. While the occasional appearance of sugar in the urine during an attack of colic is very important, it is not a *sine qua non* in the diagnosis of pancreas stone.

If the ordinary methods of medical treatment fail and attacks are frequently repeated and become more severe in character, operatory interference is indicated. The gall-bladder and pancreas should be carefully examined and if stone is present it should be removed. Frequently the palpation of small stones even in the exposed pancreas is not possible. The gall-bladder should always be drained because much drainage has a favorable effect upon an existing pancreatitis in the case of calculi.

W. A. BRENNAN.

**Mayo, W. J.: The Spleen; Its Association with the Liver and Its Relation to Certain Conditions of the Blood.** *J. Am. M. Ass.*, 1916, lxvi, 716.

The regularity with which splenic enlargements and other physical changes occur in association with diseases of the liver and of the blood has strongly impressed the author who, whenever possible, during an abdominal section examines the spleen. The examination of this organ by external means is often misleading and can never be relied on, although the X-ray offers some hope in the diagnosis of splenic pathology.

Investigation has shown that not only does the spleen extract bacteria and other toxic agents

from the blood but also conserves the food value of broken down blood-cells by sending their remnants to the liver for further elaboration. But whatever the function of the spleen is it must send its products through the splenic vein to the liver. This close association is well shown by the splenic hypertrophy attendant on liver cirrhosis and secondary liver cirrhosis in the Banti stage of splenic anæmia.

That the liver may adequately maintain this function of conservation, it has been given the power of regeneration. In all other organs of the body this power is practically nil, hypertrophy taking its place.

Adami points out that in the liver the bacteria that have escaped the leucocytes are destroyed, giving rise to pigmented areas, and Vaughan advances the theory that bacteria are not vegetable but parasitic organisms, and that diseases such as typhoid and the preventive serums act to educate the cells of the body to resistance against certain organisms and to so change the body proteins that they are no longer bacterial food.

Rosenow further demonstrates the selective affinity of bacteria and other substances for certain tissues or organs. Is it not probable that the spleen has the power of attracting certain substances in the blood as shown by splenic enlargements of typhoid, malaria, etc.?

Moreover the spleen has no internal secretion, as removal does not deprive the body of an important constituent; nor is it under complete nervous control through scanty nerve-fibers from Auerbach's plexus. It does, however, contain much non-striated muscle which is possibly responsible for the digestive rhythmic change in size.

As to the relation of the spleen to blood, normally in the foetus, the spleen, liver, adenoid, and lymphoid structures are blood-producing organs; this power, in the spleen at birth, diminishing to the production of white cells.

In the various anæmias, the spleen acts as a graveyard for the blood-cells, especially the red, not through its own initiative but as though the corpuscles were sensitized in some other place and destroyed in the spleen. Thus, the enlarged spleens so often found in these conditions may be a work of hypertrophy and it would appear that possibly this excess of splenic tissue, or hypersplenism, may cause an unnecessary destruction of the red cells, there being many exciting causes for the onset of splenic enlargements; for example, the relief of the secondary anæmia in syphilis, particularly of the liver, by the removal of the enlarged spleen.

In so-called primary tuberculosis of the spleen, the removal of the organ has occasionally benefited a few. It is likely, however, that the disease is never primary in the spleen, and such a diagnosis is rather the result of insufficient clinical study.

In the anæmia of chronic syphilis remarkable improvement followed the removal of the enlarged spleen. In chronic septic conditions with enlarged



spleens, removal does not bring satisfactory results as there is usually a very lowered resistance and a cardiorenal insufficiency to overcome.

In splenic enlargements associated with hepatic disease it is often impossible to determine whether the process is primary in the spleen or liver. In Hanot's cirrhosis, when diagnosed, undoubted benefit follows removal of the spleen.

In 4 cases the author has removed an enlarged spleen in conditions of portal cirrhosis of the liver, with much relief of the symptoms.

It must always be borne in mind that the spleen is only one avenue of entrance to the liver for noxious agents, but no matter in what manner hepatic disease occurs there is usually a concomitant splenic enlargement.

The syndrome called splenic anæmia, the terminal stage of which is known as Banti's disease, may be cured in many cases by removal of the spleen.

Cases of stomach hæmorrhage in which no other origin can be found should be carefully examined for evidence of splenic anæmia, as hæmorrhage is one of the earliest symptoms in this condition.

In Gaucher's disease, described by Brill and Mandelbaum, it is the author's experience that splenectomy in the early stages is followed by a cure.

In hæmolytic jaundice, which is of two types, that of Minkowski and that of Hayem and Widal, splenectomy gives the most brilliant results.

In pernicious anæmia, remarkable improvement follows removal of the spleen if done before the spinal cord changes occur.

Preliminary to splenectomy and often following it, blood transfusion is necessary in the majority of cases. The donor's blood should always be tested with that of the recipient for agglutination and hæmolysis.

P. M. CHASE.

**Wahl, H. R., and Richardson, M. L.: A Study of the Lipin Content of a Case of Gaucher's Disease in an Infant.** *Arch. Int. Med.*, 1916, xvii, 238.

The case on which this study is based was that of an infant eleven months of age, with a clinical picture which, in general, simulated Gaucher's disease. The spleen, liver, and lymph-nodes presented the usual changes, but the unusual feature of the case was the almost complete substitution of the medulla of both suprarenals by clusters of large pale vacuolated cells. The latter were also present in Peyer's

patches, in the intestines, and in the thymus, besides involving the adventitia of some of the smaller vessels. The process was thus much more diffused than in any case hitherto described, and also the first one described in an infant, when the condition may be more diffused than when it occurs in adults.

The author made an exhaustive study of the tissues of this case and an extensive review of the literature, the following conclusions being drawn:

1. In Gaucher's disease the liver and the spleen show not only a marked increase in the lipin content, but also a serious alteration in normal relations of the lipins to each other. The fixed fats are greatly reduced, while the lipoids, such as lecithin and cholesterol, are greatly increased. In the case studied a lecithin-like body predominated, but a cholesterolin compound may prevail in other cases.

2. In Gaucher's disease, lipid substances accumulate in the form of small droplets within the cytoplasm of the tissue-cells, resulting in the formation and accumulation of the distinctive large pale cells so characteristic, histologically, of this disease.

3. Gaucher's disease is due to a disturbance of lipid and fat metabolism, resulting in the accumulation of lipid substances in the cytoplasm of the large pale cells that are mostly transformed reticulo-endothelial cells of the spleen, lymph-nodes, and bone-marrow, and the stellate cells of the liver. These cells have the physiologic property of disposing of the fats and lipoids, and comprise the *endothelial Stoffwechselapparat*. It is thus a system disease, but involves the hæmatopoietic organs only secondarily in that they are very rich in the reticulo-endothelial cells.

4. Those organs that contain the reticulo-endothelial cells in large abundance (spleen, lymph-glands, bone-marrow, liver, stellate cells of Kupfer, etc.) show the most changes; but specific parenchymal cells may absorb some of the lipid in very advanced cases.

5. Gaucher's disease belongs to the group of xanthelasmic conditions which are characterized by a more or less diffuse accumulation of lipoids in reticulo-endothelial or in fibroblastic cells in one or more organs. It represents a more diffuse and widespread involvement of the *endothelial Stoffwechselapparat* than those cases of *grosszellige Hyperplasie der Milz* in diabetic lipidæmia, with an underlying cause that is more deep-seated and inherent in the body economy. GEORGE E. BEILBY.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Ashhurst, A. P. C.: Multiple Cartilaginous Exostoses.** *Ann. Surg.*, Phila., 1916, lxiii, 167.

Ehrenfried has recently studied the clinical entity which goes under the name of multiple cartilaginous

exostoses and prefers the name hereditary deforming chondrodysplasia. He was able to find only about a dozen cases which had been reported in America, the greatest number of cases being reported from Germany and France. As the author has seen 11 cases within the last ten years, he concludes that the disease is not so rare as it seems, but that it has been overlooked or ignored.

The underlying pathology is not the exostoses, but a chondrodysplasia affecting especially the metaphyses of the long bones, though the bones of the pelvis, the clavicles, scapulæ, and the vertebræ may be involved. The epiphysis is small or misshapen, the intermediary cartilage is narrow, irregular, oblique, or zigzag, and sometimes prematurely ossified. Scattered along the ends of the shaft beneath the periosteum are clumps or nests of cartilage cells persisting uncalcified where they are left in the process of growth. Later, these groups may develop into the cartilaginous exostoses, which give the disease its name, but these are merely incidental. A malignant osteocartilaginous tumor may develop in one of these exostoses. Certain secondary characteristics usually are present, such as low stature due to the shortness of the limbs, particularly the lower. There often is a lack of growth of the ulna and pes valgus is frequent as the result of the lack of growth of the fibula. The disease is transmitted by both affected males and females and by unaffected females, but there is no evidence that it may be transmitted through unaffected males.

The author reports 11 cases which he has observed and two others from the service of Taylor which he did not have the opportunity to observe. In addition, he reports 5 cases which present no skeletal deformities and no evidence of being hereditary, but which are examples of some type of chondrodysplasia. GATEWOOD.

**Davidson, A. J.: Subungual Exostosis.** *Am. J. Orth. Surg.*, 1916, xiv, 150.

The author observed 5 cases of painful enlargement of the distal extremity of the great toe due to subungual exostosis. They were all males under 30 years of age. No history of injury or infection could be obtained. The process requires from six to twenty-four months to develop sufficiently to cause the patient to seek advice.

The etiology of exostoses in general may be summed up as: (1) those due to direct infection; (2) those due to direct trauma; (3) those associated with tendon or ligamentous strain, i. e., static.

In the cases referred to by the author there was no history of infection of any kind, nor were there any inflammatory signs of either the matrix of the nail, the bone, or of the soft parts. Exostoses of the variety described could not be credited to any associated tendinous or ligamentous strain for the reason that no tendon or ligament is attached to the portion of bone from which the growth arises.

By excluding these possible explanations it brings us to a consideration of trauma. The location of the exostosis is at a point which is frequently the site of trivial injuries and which is being constantly subjected to the continued pressure of the stiff boxing of shoes. The usual atrophic conditions of the flexor muscles of the toes have the effect of increasing the power of the extensors, placing the toes in a position to bear the brunt of this shoe pressure.

Regardless of the fact that no history of direct trauma could be obtained in any of his reported cases, Davidson thinks it is quite possible that subungual exostoses are the result of trivial injuries or occur following the prolonged irritation of shoe pressure which may, or may not, be appreciated by the patient. PHILIP LEWIN.

**Berry, J. M.: Retarded Ossification as an Etiologic Factor in Traumatic Arthritis and Epiphysitis.** *J. Am. M. Ass.*, 1916, lxvi, 868.

Three cases are reported in boys seven to ten years of age. In general the symptoms are the same: pain and swelling in the joints of the lower extremity, a slight rise in temperature, and some limitation in motion. X-ray examination showed a retardation in ossification in the areas involved and also in the wrists.

The cases show that retarded ossification may be an etiologic factor in the production of traumatic arthritis and epiphysitis in children. The trauma in such cases consists in overstrain of the joints due to abnormal activity. The child may be leading the normal active life of a child of his own age, but anatomically he belongs to a type several years younger, and to avoid strain his activities should be correspondingly restricted. Cases of this character are probably quite common and are very apt to be overlooked or wrongly diagnosed.

EDWARD L. CORNELL.

**Fieux, G.: Treatment of Purulent Arthritis of the Knee by Arthrostomy or Marsupialization of the Synovial Sac** (Le traitement des arthritides purulentes du genou par l'arthrostomie ou marsupialisation de la synoviale). *Presse méd.*, 1916, p. 107.

Fieux affirms that in injuries of the knee-joint one of the factors which engenders rapidity of suppurative diffusion is the difficulty of drainage or rather inefficacy of evacuation with drainage. According to Delore and Kocher arthrotomy for drainage is a blind method which is often insufficient.

Fieux has observed in the wounded cases under his care that there was retention of pus in the serous cavity in spite of the presence of several large permeable drains. From close observation he came to the conclusion that it was the drain itself that formed the obstacle to drainage. He therefore replaced arthrotomy with drainage by arthostomy, creating one or more articular mouths kept wide open which allowed the continuous evacuation of the infected joint contents without the aid of any tube. He gives the details of seven cases treated in this manner.

This method of evacuation of the knee-joint in no way obviates the indications for resection of the knee which have recently been formulated by Tuffier and others; but it is incontestable that the more quickly and better septic products are evacuated from the synovial spaces, the less the indications are for resection. This is why he thinks that arthros-



tomy is superior to arthrotomy incisions with drain-tubes.

W. A. BRENNAN.

**Dunlop, J.: A Deposit in the Supraspinatus Muscle Simulating Subacromial Bursitis.** *Am. J. Orth. Surg.*, 1916, xiv, 102.

The author reports a case of a large deposit about the tendon of the supraspinatus, as well as a considerable deposit in the belly of the muscle demonstrated by stereoroentgenograms.

The treatment instituted was a plaster-of-Paris cast, such as is used in the abduction position for fracture of the neck of the humerus. This was applied under nitrous-oxide anæsthesia. After ten days the cast was removed and the support and position were gradually done away with. Hot air bakes are useful in such cases in relieving pain and hastening the return of normal motion.

PHILIP LEWIN.

### FRACTURES AND DISLOCATIONS

**Hitzrot, J. M., and Bolling, R. W.: Fractures of the Neck of the Scapula.** *Ann. Surg.*, Phila., 1916, lxiii, 215.

Fractures of the neck of the scapula with or without involvement of the glenoid fossa, while not common, have been found to be of more frequent occurrence since the advent of the X-ray. These fractures fall into the following groups:

1. Fractures of the surgical neck of the scapula.
2. Fractures of the lower half of the neck of the scapula.
3. Fractures of the neck of the scapula beginning at the notch and extending downward through the base of the coracoid process to the glenoid fossa.
4. Fractures of the anatomical neck.
5. Stellate fractures of the glenoid fossa of the scapula.
6. Fractures of the rim of the glenoid, with or without fissures running into the neck. This type is frequent in dislocation of the shoulder, and as they occur as complicating injuries of dislocations, the authors have not included them in their review of the literature.

There is no authentic case of the fourth type recorded in the literature.

The authors report nine cases and the results of some experiments upon the cadaver. From their observations they conclude that the description of the deformity resulting from fracture of the region of the neck of the scapula as ordinarily given is not correct and that the fracture in this region may occur without any recognizable deformity. They believe that the clinical manifestations of the fracture are insufficient to make a positive diagnosis, and that the X-ray is an essential factor in the diagnosis. The immobilization of the arm by a Velpeau or similar bandage is all that is necessary in the way of treatment, and manipulative efforts have no effect upon the displacement which occurs at the line of fracture. By massage, baking, and careful

after-treatment practically perfect functional results will be obtained. Should a type of fracture occur in which the displacement actually promises bad results, the fracture could best be treated openly by approaching it from behind and the glenoid fragment pried into position, with correction of the coincident injuries by appropriate methods of repair of the ligaments, etc. Including the cases reported by the authors, there are only about forty cases in the literature in which the diagnosis has been confirmed by X-ray or by autopsy.

GATEWOOD.

**Roberts, J. B.: The Artificial Periosteum for Fixation of Shaft Fractures.** *Ann. Surg.*, Phila., 1916, lxiii, 182.

Although the author has not changed his views in regard to the closed method of treating the great majority of fractures, he advocates the use of an artificial periosteum in certain cases in which there are definite indications for an open operation. Instead of the woven catgut rugs suggested by D. C. Straus, the author suggests the use of an autogenous graft of fascia. He states that the use of fascia may be varied for the various types of fracture; for instance, two narrow splints may be wrapped about the bone a considerable distance from each other in case of a very oblique fracture, or a wider band used where the fracture is more transverse. The object of the fascial tube is to make an artificial periosteum which would act as an absorbable support for shaft fractures. The author has not demonstrated the efficiency of such a method of fracture treatment either by experimental work or by actual use in suitable cases.

GATEWOOD.

**McGlannan, A.: Fracture of the Neck of the Femur; a Study of the Treatment and End-Results of 55 Cases.** *Surg., Gynec. & Obst.*, 1916, xxii, 287.

The author reports 55 cases of fracture of the neck of the femur that have come under his personal observation in the past eight years. In this series 36 recent fractures and 7 old fractures were treated, and 12 patients were not treated.

In all cases, full abduction, with downward traction and inward rotation, was the position obtained in the reduction of the fracture. The full abduction was assured by fixation of the pelvis by abducting the sound leg, and the inward rotation by lifting the trochanter forward. Impaction was separated in 6 cases, and in the seventh was not disturbed because the impaction occurred with abduction of the thigh. This is an unique observation.

Various forms of fixation were used, from firm plaster-of-Paris cast to loose tying out of the thighs. Direct extension by ice-tongs was used in 3 hand-capped patients, one of whom died. Nailing the fracture was done twice.

For the old cases, bone-graft was used once, nailing twice, removal of head once, subtrochanteric osteotomy twice, freshening fragments once.

Of the recent cases four died and in one the fracture failed to unite. One of the old cases resulted fatally and the patient still walks on crutches 7 years after treatment.

Treatment was refused by 2 young adults, with vicious union. Ten patients were not treated on account of feebleness and circulatory, pulmonary, renal, or nervous symptoms. Two are living several years after the injury, aged 88 and 90 years, respectively. Delirium tremens and evidence of drug addiction or uræmic manifestations make the prognosis grave. Loss of control of bladder or rectum seems to indicate an inability to stand fixation. The effect of the healed fracture on earning capacity is noted in 10 cases, the average loss being 15 per cent, after a period of disability lasting from 6 months to 1 year and 3 months, with an average close to 1 year. The occupation of these patients included hotel manager, restaurateur, farmer, housekeeper, seamstress, laborer, tailor, motorman, and market driver.

#### SURGERY OF THE BONES, JOINTS, ETC.

**Burckhardt, H., and Landois, F.:** Experiences in the Treatment of Infected Joints in War (*Erfahrungen ueber die Behandlung inficierten Gelenke im Kriege*). *Beitr. z. klin. Chir.*, 1916, xcvi, 358.

The authors have reported their methods in a previous communication but were then unable to report on the end-results. They now report these

end-results and are able to state their conclusions on a more definite basis. This study is a contribution to the question whether resection of a joint is justifiable in war or not.

In all severe cases of joint infection, the indications alone must decide whether resection or amputation is to be resorted to. Resection is generally done (1) in the field hospital as part of the immediate treatment of the wound; (2) later on, on some vital indication when amputation is avoided; (3) after a longer period when it is thought to effect healing of a chronic joint suppuration.

The most important and the most frequently observed cases of joint infection are those of the knee-joint, which when badly infected are almost as important as hip-joint infections as regards relation to life and function. If the fissures extend well into the tibia amputation is the best method, but if amputation is not done, then a radical resection with ablation of the bone ends is preferable to simpler procedures.

Regarding individual joints: resection in the case of the hand-, foot-, and elbow-joints gives good results. In the case of the knee-joint resection is indicated if the general state is good and there is only a moderate amount of bone destruction and if a sufficiently long treatment of the patient in one place can be assured. But the general results are poor and although the limb is preserved pseudarthrosis usually results. Nevertheless, resection or at least some simpler operation should be tried

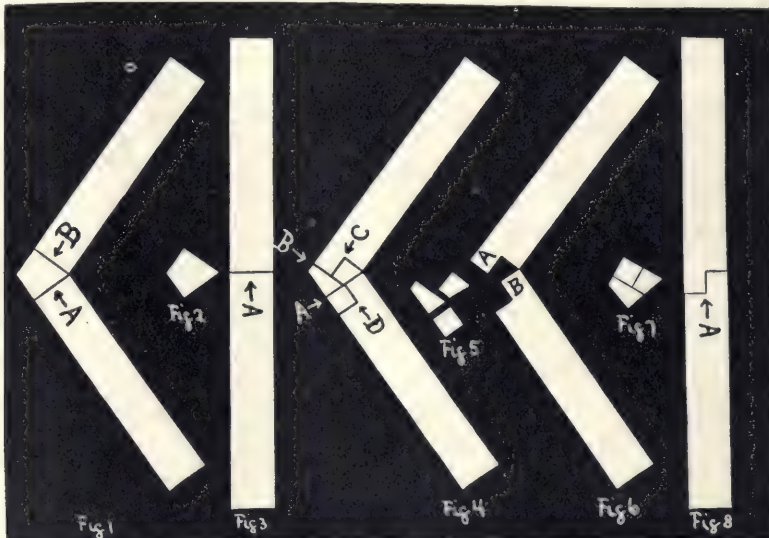


Fig. 1. Cuneiform osteotomy, showing lines of section at A and B.

Fig. 2. Wedge removed in cuneiform osteotomy.

Fig. 3. Bone straightened after cuneiform osteotomy, showing transverse joint at A.

Fig. 4. New operation; lines of section at A, B, C, D.

Fig. 5. Fragments removed in new operation.

Fig. 6. Shape of bone ends after removal of fragments.

Fig. 7. Rearrangement of removed fragments. Note that combined they correspond exactly in size and shape to the wedge shown in Fig. 2.

Fig. 8. Bone straightened after new operation, showing overlapping joint at A. Note that the length of the bone is exactly the same as in Fig. 3. (Hoffman.)



when the above conditions are present. If they are not, then amputation must be done to save the patient's life.

In the shoulder-joint resection gives better results. In infected hip-joints, the casualties are very great and resection very rarely saves the life of the patient.

W. A. BRENNAN.

**Hoffman, P.: An Overlapping Joint as a Substitute for Cuneiform Osteotomy.** *Am. J. Orth. Surg.*, 1916, xiv, 96.

The author devised an operation that substitutes for the simple transverse joint made in the cuneiform section, an overlapping one that is less liable to displacement. There is an underlying simple general plan that involves two linear cuts and the removal of two corners of bone, no matter what the degree of angularity.

The first cut is perpendicular to the long axis of one of the arms of the deformed bone, on a level with the apex of the angle on the concave side of the bend. This divides the bone into a longer and a shorter segment.

The second cut is made perpendicular to the long axis of the longer segment, on a plane parallel with, but distal to, the cut that would have been made in a cuneiform osteotomy. The more distal this plane, the longer will be the overlapping tongue of the resulting joint.

Next, the end of the longer segment is turned out through the skin incision and a corner is removed from its deeper side. The longitudinal cut should be parallel to the long axis of the segment and should divide the bone equally; the transverse cut should be on a level with what was the apex of the

angle on the concave side of the deformity. This leaves a projecting tongue, half the thickness of the bone on the superficial side of the end of the longer segment. Next, a corner is cut from the superficial side of the end of the shorter segment which leaves a tongue projecting from the end on its deep side. The two corners should fit each other. The accompanying diagrams illustrate the steps.

No bone-suture is necessary. All the bone cuts are made with an ordinary flat saw. The combined fragments correspond in size and shape to that removed by cuneiform osteotomy and the length of the bone is exactly the same as after that operation.

PHILIP LEWIN.

**Kane, E. O.: Preliminary Report on Device for Intramedullary Fracture Splinting.** *Internat. J. Surg.*, 1916, xxix, 33.

An expanding scroll cylinder of thin steel is recommended to replace the short ivory or bone peg for intramedullary splinting of long bones. After clearing the medullary cavity by curette or drill the length of the splint at one extremity and half its length at the other the cylinder (secured from expansion by a silk cord firmly tied about the middle) is thrust its full length within the longer excavation. The broken ends of bone are approximated and the cord pulled firmly. The splint slides half its length from its bed into the opposing cavity. The cord is then cut free from the cylinder, the scroll expands, filling the cavity tightly and holding the fracture immovable.

This method provides sufficient space without traction or angulation of the opposing fragments, yet a splint fully twice the length of the usual peg

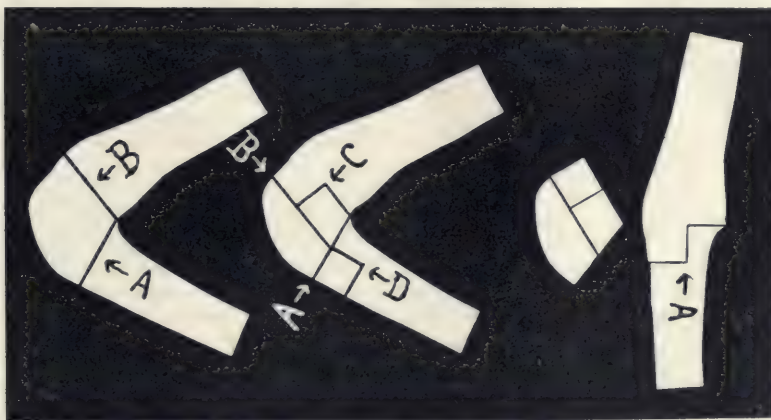


Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 9. Tracing of radiography, showing cuts, A and B, that would have been necessary for a cuneiform osteotomy, and the resulting wedge fragment.

Fig. 10. Tracing of radiograph, showing cuts, A, B, C, D, actually made in the author's operation and the resulting fragments removed.

Fig. 11. Rearrangement of removed fragments. Note that combined they correspond in size and shape to the wedge shown in Fig. 9.

Fig. 12. Bone straightened after operation, showing overlapping joint at A. (Hoffman.)

can be inserted; consequently a very oblique fracture is held as accurately in position as if it were transverse. The tissues are disturbed but slightly, the technique is simple, the procedure rapid. The hollow cylinder permits new medullary and bone formation, and being of the thinness of tissue paper (two-thousandths of an inch in thickness) the steel can corrode away.

**Chaput: Resection of Almost the Whole of the Humerus for Fistulous Osteomyelitis, Followed by Osseous Reproduction Without Shortening and with the Production of a New Humeral Head** (Resection de la presque totalité de l'humerus pour ostéomyélite fistuleuse, suivie de reproduction osseuse sans raccourcissement avec production d'une tête humérale nouvelle). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 433.

The author reports a case of multifistulous osteomyelitis in a boy of 16. In February, 1914, Chaput resected from 12 to 15 cm. of the lower part of the humerus. Later on in May, 1914, owing to the development of a fistula the upper third of the humerus comprising the articular extremity was ablated. Cicatrization occurred in from two to three months; the bone reproduced and united with the new bone of the lower region.

This reproduction of almost the entire humerus Chaput explains as being due to the preservation of the periosteum and the youth of the patient. Up to the twentieth year the regenerative power of periosteum is very active. After thirty grafts are indispensable.

The continued use of extension in this case prevented shortening. The reproduction of the humeral head is very interesting. It has only been possible owing to the abundant formation of bone which has been facilitated by movement. W. A. BRENNAN.

**Albee, F. H.: A Statistical Study of 539 Cases of Pott's Disease Treated by Bone-Graft.** *Am. J. Orth. Surg.*, 1916, xiv, 134.

With the object of securing a report of results obtained by others with the bone-graft treatment of Pott's disease, a large number of printed questions were sent to surgeons in this and foreign countries who had performed this operation.

Thirty-three surgeons reported a total of 299 results, in 229 of which the disease was pronounced arrested; in 59 the condition was improved. Of the 299 patients 12 died, 4 of these fatalities being reported as due to shock. The remaining 8 cases died four months or longer after the operation, either from complications or from intercurrent diseases. In 5 of these cases the symptoms from spinal disease were entirely controlled. In 3 of the 4 cases in which death was due to shock, the chisel and mallet were used to obtain the grafts.

Of the 33 surgeons 16 reported 100 per cent of the cases as disease arrested; 10 reported that they did not use plaster jackets or spinal support beyond the period of immediate post-operative recum-

bency; 9 reported 100 per cent of cases arrested and one secured 88 per cent of good results.

Of the author's personal cases only those that have been operated upon one year or longer are included in this report. There are 198 of these; in 184 the disease was arrested, in 2 there was improvement. To date 12 died, 6 of these 12 were entirely relieved of their Pott's disease symptoms and died of some intercurrent disease.

One case died of an unknown cause the day after operation, one died of acetonuria on the fourth day, one from status lymphaticus, one died two years after operation from suppurative meningitis following a skull injury. Autopsy showed complete cure of the tuberculous spine. One died of pneumonia one week after operation. Others died of amyloid degeneration of the viscera, tuberculosis of the lung, and an acute abdominal condition. Only 3 of the 539 cases have died of tuberculous meningitis. In no case has there been any trouble with the tibia from which the graft was removed.

The ages of the patients varied from 20 months to 65 years. Of the total 539 cases, the disease was arrested in 460; the condition was improved in 59; in 20 unimproved. There were 9 deaths after operation. In 6 instances death occurred long after operation and after all spinal symptoms were entirely relieved.

The author concludes his interesting paper by stating that every diagnosis of Pott's disease should be confirmed by an X-ray examination which should include an anteroposterior view, as well as a lateral or an oblique lateral. The disintegration and crushing of the vertebral bodies should always be demonstrated before advising the operation. This is necessary not only to confirm the diagnosis but it is most imperative to determine the number and the particular vertebrae involved so that the graft can be correctly placed.

PHILIP LEWIN.

**McWilliams, C. A.: Homoplastic Transplantation of a Boiled Segment of a Radius.** *Ann. Surg., Phila.*, 1916, lxiii, 185.

Berwer, in January, 1912, transplanted a radius from a suicide into the arm of a patient operated upon a few days previously for sarcoma of the radius, in whom it had been found necessary to remove the lower two and three-eighths inches of the bone. The transplant was boiled for an hour and kept in normal salt solution for four days. Primary union occurred without any subsequent discharge.

The author reports the Brewer case as an example of a homoplastic transplant which has been at least partially successful. From the present roentgenogram it appears that the portion of the graft nearest to the living bone has regenerated completely or has been entirely substituted; that that farther away has been only replaced, while the free end was entirely absorbed. The author believes that an autogenous transplant would have given better results. He concludes that dead bone merely acts



as a conductor, and that if homoplastic transplants are employed at all they should be taken from living individuals and transplanted with the periosteum. The success of a homoplastic transplant will depend upon the serological relations between the individual from whom the graft is taken and the one into whom it is to be grafted. The case is of interest on account of the extreme rarity of reports of successful homoplastic transplantation. In conclusion, the author gives a summary of the cases of living and dead homoplastic bone transplantations in the literature, between thirty and forty cases in all.

GATEWOOD.

**Freiberg, A. H.: Tendon-Transplantation in Infantile Paralysis.** *Lancet-Clin.*, 1916, cxv, 179.

Tendon-transplantation is a measure of utmost value in paralysis following anterior poliomyelitis, but the end-results have not yet shown unqualified success. Primary results have been attractive, but the corrections have often been only temporary. The failures have been due to various impractical mechanical conditions. Stoffel's prerequisites for successful transplantation are: (1) The transplant must bear a fairly close morphological and functional relationship to the muscle whose function it is to supplant. (2) The transplant must be fastened to its new point of insertion under physiological tension only. (3) The transplanted muscle must not be used to hold the limb in a corrected position.

Freiberg describes his operation for paralytic equinovalgus. He divides the Achilles tendon, and taking the extensor longus hallucis, passes it through the same compartment in the annular ligament with the tibialis anticus and sews it to the periosteum in company with the insertion of the tibialis anticus. Thus the direction and insertion of the two muscles are practically identical. Freiberg emphasizes the necessity for direct and simple operative plans, and condemns the attempts at converting flexors into extensors, etc.

In the treatment of infantile paralysis during the first year, mechanical support must be used to protect the paralyzed muscles from overstretching, also muscle-training, massage, and local heat should be used, but by no means any form of electricity. Only after a long period should any operative procedure be considered.

R. G. PACKARD.

**Ryerson, E. W.: Deformities Due to Infantile Paralysis; Operative Treatment.** *Am. J. Orth. Surg.*, 1916, xiv, 59.

While it is undoubtedly true that some cases are best treated by apparatus it is especially effective in flail knee-joints where both the flexors and extensors are paralyzed, and the best treatment is a brace with a lock-joint. If a single hip-joint is flail arthrodesis is best; if both hips are flail apparatus is a necessity. With these exceptions practically all other leg and foot deformities and weaknesses can be treated better by operation than by apparatus.

The practice of repeated tenotomy and brace-wearing is to be strongly condemned. Where any reasonable operative procedure can free the patient from the need of apparatus, it should be used. No radical operation should be performed until at least two years have elapsed after the attack of anterior poliomyelitis. During this time an attempt should be made to favor the return of power to all unparalyzed muscle-fibers. Deformity should be prevented, if possible, by apparatus, such as braces or plaster-of-Paris splints. The patient should be compelled to use the weakened muscles. Electricity, massage, and hot and cold water should be used to stimulate the nutrition of the muscles. If at the end of two years the condition is not satisfactory, a thorough anatomical examination should be made to determine what can be done by operation.

For drop-foot Ryerson recommends either splitting or lengthening the tendo achillis, if short, by Bayer's tenotomy. If the extensors of the toes are active they may be fastened to the metatarsal bases, preferably by passing each through a hole drilled in its respective bone or by splitting the periosteum, gouging out a groove in the bone, and sewing the tendon into the groove beneath the periosteum.

For paralysis of toe extensors as well as of the tibialis anticus one or both of the peronei may be displaced forward in front of the malleolus and sewed to the scaphoid or middle cuneiform. If the tibialis posticus be active, it may also be displaced forward, like the peronei, and may be needed to check the tendency to valgus. In simple drop-foot as well as in varus or valgus deformity, the astragaloscaphoid arthrodesis should always be performed by firmly sewing the bones with several bichloride silk or kangaroo tendon sutures. In 15 cases where the author has split the gastrocnemius and passed one half of it forward to act as a dorsiflexor of the foot, he failed to obtain active function although it acted as a good check-ligament.

He recommends Gallie's operation to control the equinus but in his experience of 25 cases it repeatedly failed to prevent lateral deviation. He says it should invariably be supplemented by arthrodesis of the astragaloscaphoid joint or by taking a strip of periosteum and bone from the tibia and implanting it in a groove cut along the inner side of the astragalus, the internal cuneiform, and the first metatarsal bones.

Heavy bichloride silk ligament from a hole drilled in the tibia running down under the annular ligament to the inner and outer metatarsal bones gives excellent results where there is no lateral deformity. It should be combined with astragaloscaphoid arthrodesis.

For pes calcaneus, Whitman's operation is the best. For paralysis of the extensor quadratus of the thigh the author strongly recommends the transplantation of a healthy biceps and semitendinosus forward into the patella. In contractures of the tensor fascia lata and other structures around the



hip, the subperiosteal method of Souttar is excellent. PHILIP LEWIN.

### ORTHOPEDICS IN GENERAL

**Corner, E. M.: Deformities of the Feet.** *Clin. J.*, 1916, xlv, 93.

The author discusses various deformities of the feet from the standpoint of the normal positions and movements of the foot. Deformities are variations from these normal conditions. The foot at rest normally is in a position of moderate calcaneus while the active foot is in a position of talipes equinus. At the ankle-joint the movements of dorsal and plantar flexion of the foot occur, at the midtarsal joint abduction and adduction occur. Pes planus is a deformity of abduction and pes cavus is one of adduction. Abduction causes a depression of the normal arch of the foot but paradoxical as it may seem some persons have all the symptoms of flatness of the foot but nevertheless have an arched instep. By means of diagrams he shows the occurrence of callosities on the soles of the feet which are caused by the assumption of these varied positions, thus the abducted foot has its typical localized callosities, the adducted its own, etc. The deformities of the active foot, talipes equinus and pes cavus, usually cause few symptoms, but the deformities of the inactive foot, talipes calcaneus and pes planus, require treatment.

At the metatarsophalangeal joints, he describes the deformity of hallux rigidus which in the active position develops into hallux extensus and in the inactive position, into hallux flexus. These are caused by bosses of bone developing on the dorsal or under surfaces of the head of the metatarsal bone. If they grow out laterally they produce hallux valgus or hallux varus depending upon the side they grow upon. The treatment is the operative removal of these bony outgrowths, with the wearing of properly shaped boots. R. S. BROMER.

**Lovett, R. W.: The Superstition of Flat-Foot.** *Pediatrics*, 1916, xxviii, 16.

From a study of the feet of 800 nurses the author concludes that the troubles ordinarily described as "flat-foot," "pronated-foot," and "weak-foot" are not due to any particular type or structure of foot. A foot with a high arch was found to be slightly less enduring than the low-arch type. He concluded that the trouble was due to muscular strain. Frequently the arch of the sole of the foot is not so high as the arch of the foot, and this is apt to cause strain.

Painful rigid flat-foot should be treated by manipulation under ether or by operation. Painful flexible flat-foot or foot strain will require the temporary use of a support. The arch of the sole of the shoe should also be raised sufficiently to support the arch of the foot. I. BAUMAN.

**Schmidt, M.: Congenital and Especially Bilateral Elevation of the Scapula** (Ueber den angeborenen insbesondere doppelseitigen Schulterblatthochstand). *Ztschr. f. orthop. Chir.*, 1915, xxxv, Mar.

There are 16 cases in the literature of bilateral elevation of the scapula. Various theories have been offered as to the cause of the deformity: lack of amnios fluid, exostoses, muscular defect, intra-uterine poliomyelitis, and malformation of the scapula, also the arrest of the normal descensus of the shoulder-blade.

The technique of the operation which was performed by Vulpian is as follows: Incision along the spine of the scapula directly to the bone; elevation of the periosteum and entire resection of the bony part of the fossa supraspinata. This part of the scapula appears to be bent forward over the shoulder. The median part of the scapula and an exostosis reaching from the median border into the depth are also resected. Then a subcutaneous tenotomy of the tendons of the posterior wall of the axilla is performed. A plaster-of-Paris dressing in abduction is applied and left on for four weeks, followed by massage. Orthopedic gymnastics are of prime importance in the after-treatment of the deformity. In the case described, the elevation of the arm was increased from 85 to 128 degrees. A. STEINDLER.

**O'Reilly, A.: Results of Non-operative Treatment of Infantile Paralysis.** *Am. J. Orth. Surg.*, 1916, xiv, 143.

The author's paper is based on a study of the cases of infantile paralysis treated at the out-patient clinic of the St. Louis Children's Hospital and the Washington University Medical School. The majority of cases seen were paralyses of the lower extremity. The muscles are put in equilibrium and all strain is removed from the weak or paralyzed muscles. In the majority of cases a brace is applied. Originally the brace was attached to the shoe. For the past two years sandals have been used. Any deformity due to contractures which does not yield to stretching is corrected by tenotomies.

The patients come to the clinic three days a week for massage and muscle training, and the mothers are instructed how to massage them on the other days.

From an analysis of 114 cases treated the author concludes that it is very difficult to treat infantile paralysis non-operatively in an out-patient clinic owing to the difficulty of inducing the patient to attend regularly for any length of time.

From 40 to 45 per cent of the cases show some improvement when treated by braces and this percentage is not materially increased by the use of massage. Improvement in all cases in which it was used was not great, and recovery of muscle power in stretched and exhausted muscles seems to be slight. In the majority of cases no improvement took place after six months especially in the more severe cases. He believes that one is safe in operating on any case of infantile paralysis after the first year and that it should be done in suitable cases. PHILIP LEWIN.



## SURGERY OF THE SPINAL COLUMN AND CORD

**Cates, B. B.: Spina Bifida.** *Boston M. & S J.*, 1915, clxiv, 420.

The author reports 9 cases of spina bifida coming under his care, making in all 16 cases which he has treated. The ages varied from 21 days to 12 years, though with the exception of 2, the ages averaged about eight weeks. The history of each is given in full. Of the author's 16 cases, 10 survived beyond a post-operative period of three months. He believes that the age of the patient is not such an important factor in determining the personal equation as the physical condition, and believes the surgeon may with a clear conscience urge the lesser of two evils, operation under the most favorable conditions, rather than rupture with risk of infection and meningitis. **EMIL C. ROBITSHEK.**

**Rugh, J. T.: Bone-Grafting for Spinal Conditions; Report of Forty Cases.** *Am. J. Orth. Surg.*, 1916, xiv, 71.

The author claims six advantages for the bone-grafting operation, viz.:

1. It accomplishes fixation in less than a year, in marked contrast to the four to ten years required by other methods.
2. Under this fixation treatment, nature will more rapidly fill in or solidify the diseased area.
3. An abscess formed or in the process of formation will usually disappear without tapping or opening.
4. Very low mortality.
5. Manipulations are all done in normal healthy tissues in the vast majority of cases.
6. The economic advantage which in the case of the wage earner makes him an independent member of the community within a year.

In his experience with forty cases Rugh has found no disadvantages that can be attributed to the operation *per se*.

He believes that the operative fixation of the spine is the treatment of choice, for spinal caries and certain other conditions, and especially so in cases past 12 or 14 years of age. He reports a series of forty operations with 74.3 per cent of excellent results, and Lange's requirements were fulfilled in that he "placed the brace under the skin and shortened the time of efficient recovery."

**PHILIP LEWIN.**

**Claude, H., and L'Hermite, J.: Anatomo-clinical Study of a Case of Total Section of the Spinal Cord** (*Étude anatomo-clinique d'un cas de section totale de la moelle*). *Bull et mém. Soc. méd. d. hôp. de Par.*, 1916, xxxii, 476.

The authors consider that the case now reported upon by them presents a double interest inasmuch as it shows unusual clinical expressions of total section of the spinal cord, and that it permits of

localizing the origin of certain reflexes which up to now have been matters of discussion.

There is no certain symptom which allows the diagnosis of total section of the spinal cord, while some patients exhibit all the classical symptoms, yet anatomical examination proves that the medullary axis is preserved in its continuity. The case now presented, while showing unusual features, allows this diagnosis and also indicates how certain traits must be interpreted.

The patient was a soldier who in consequence of injuries presented a vertebral fracture with very marked gibbosity in the region of the eighth spinal dorsal apophysis. Examination 19 days after the injury showed complete anæsthesia as far as the eleventh dorsal root; complete abolition of the rotulian and achillean reflexes and of the lower abdominal reflexes; inversion of the plantar cutaneous reflex; absolute retention of urine; relaxation of the anal sphincter, etc. Forty-eight days after the injury there was a reappearance of the tendon reflexes which were exaggerated. Eight days later, defense movements of the lower limbs were noted and within a few weeks more there were automatic movements of the limbs. These movements were preserved up to the time of the patient's death which occurred four and one-half months after the injury.

The reappearance of the automatic movements suggested a very severe compression rather than a total section of the cord, and surgical interference was suggested but refused by the patient.

Autopsy clearly showed that there was a fracture of the dorsal vertebra; the spinal cord was not only compressed but literally crushed, this crushing corresponding to a total section. There was a complete isolation of the lumbar and dorsal cord as well as of the encephalic connections.

The authors observe that their findings show that while in the majority of cases of total section there is a flaccid paraplegia with muscular hypotonus and abolition of tendon reflexes; yet sometimes after such symptoms there may be clinically a restoration of certain tendon reflexes, even an exaggeration of them, and an increase of reflexes of defense and of spontaneous movement. The phenomena displayed by the author's patient was in contradiction to the law of Jackson-Bastian, according to which every complete section of the cord is accompanied by an absolute anæsthesia and a flaccid paraplegia with definite abolition of the tendinous reflexes.

The authors account for the exaggerated tendon reflexes by the compression of the lower trunk of the cord, owing to the presence of an anterior dura mater nodule. This slight compression, by increasing the dynamism of the gray matter, seems to be the most valid cause of the tendinous supreflexivity. As regards the defense movements the authors agree with Marie, Foix, and Dejerine that they are due to medullary automatism.



In further considering the phenomena observed in their case, the authors observe that the preservation of the spinal vessels assured the lower segment a better nutrition than in cases where the isolated segment is deprived of all vascular connection with the encephalic segment. Moreover in their case the circulation of the cephalorachidian liquid was not sensibly disturbed, and as a consequence there was no interference with the osmotic phenomena of the nerve-cells through the pericellular and perivascular lymphatic spaces. W. A. BRENNAN.

**Jonas, A. F.: Dislocation of the First Cervical Vertebra Produced by Manipulation.** *Tr. Am. Surg. Ass.*, Washington, 1916, May.

The author reports one case which is made the subject of his paper. The patient was a farmer who appeared for examination in August, 1915, with his head dropped forward, face partly turned toward the right side, and his chin resting on his sternum. His eyebrows were highly elevated. His neck seemed to be fixed, for he did not make the slightest cervical rotation. A lateral view disclosed the upper end of the cervical region projecting sharply backward on the occiput. His appearance suggested a destructive cervical spondylitis or an occipitocervical neoplasm. He spoke with difficulty for he could separate his jaws only to a very limited extent.

He stated that he had not been able to turn nor raise his head for more than a year and that his condition was due to manipulations received at the hands of an osteopath while under treatment for "generalized rheumatism." He had been placed on his back on an operating table and the treatment was begun with vigorous and forcible rotations of the head. The operator, standing at the head of the table, had grasped the patient's head with both hands, one resting on either side of it, two fingers, the index and middle, beneath each horizontal maxillary ramus, and while being held thus, his head was "twisted" from side to side by extreme and forcible rotations, causing great pain. He suddenly felt and heard a loud painful snap in the back of his neck at the base of the skull and his head became fixed in the position described and had so remained. He stated that his condition had become unbearable on account of the pain in the back of the neck and occiput and his inability to separate his jaws enough to enable him to eat or speak with freedom. He had had an almost constant vertical headache as well as pain in the neck since the accident.

On examination, any attempt to rotate his head caused a marked muscular spasm involving all the cervical muscles, especially the trapezii and sternocleido mastoids. An osseous projection was not only palpable but distinctly visible in the occipitocervical space. This appeared to be a spinous process belonging either to the first or second cervical vertebra. The tip of the spine appeared to deviate to the left of the median line. It was tender on pressure and caused the patient to flinch decidedly. In-

spection and palpation of the pharynx disclosed an irregularity and tenderness at the nasopharyngeal junction.

It was evident that it was a case of luxated cervical vertebra, probably the first one, the atlas. There had been no cord pressure symptoms, except for an occasional tingling of short duration in both arms and hands. There had been no motor disturbances; all reflexes were normal; and a careful search for sensory changes was negative. A skiagram presenting a lateral view of the cervical spine revealed a retrodisplacement of the atlas. The space between the posterior margin of the foramen magnum and the first cervical spine was clearly increased. The condition was not clear on first inspection owing to the fact that the spine of the second cervical vertebra is much larger and longer under normal conditions than that of the first, the latter usually being absent or rudimentary. Further, a dislocation at this point without a fracture of a transverse or articular process of the axis and an absence of cord lesion is improbable. Therefore, it was evident that there was a slipping forward of the head on the atlas involving the occipito-atlantal articulation. The occipital condyle, probably the left one, had slipped forward so that it rested in front of the margin of the left superior articular surface of the atlas, causing a fixed rotary anterolateral flexion of the head. The patient was informed of his condition and advised to return to the osteopath as this class of practitioners consider themselves super-bone-setters. He declined in as vigorous English as his set jaws would permit and insisted that the author make a manual reduction. He was informed that this was out of the question because one could not hope to reduce a dislocation in this region that had existed more than a year, much less hope for an accidental readjustment, and at the same time avoid an injury to the medulla. It was agreed that an effort at manual reduction should be made and, if unsuccessful, an immediate open operation should be done.

Accordingly, under complete ether anæsthesia, guarded rotary manipulations with pressure over the prominent cervical spine were carried out and, as was expected, without results. The patient was placed in the ventral position and brought forward on the operating table so that his shoulders rested on its edge and the forehead was placed on a Cushing bench. A laminectomy had been planned because it was considered impossible to effect a safe operative replacement of the dislocated atlas after having been displaced for more than a year. The chief object to be achieved was to remove the left axial facet as well as the lamina to enable the patient to elevate his head so as to relieve the pressure of the chin on the chest. Through the usual posterior incision the arch of the atlas together with the left superior articular surface was removed with a rongeur forceps. A distinct anteroposterior movement of the head could not yet be made. The right atlanto-occipital articulation was affected only in a rotary



way, and as its articular surfaces were in contact and immovable it was decided to remove enough of the articulation to mobilize it. This was accomplished so that anteroposterior movements became fairly good. The wound was closed and dressed in the usual aseptic manner. The operative recovery was normal. The immediate operative effect was

to permit the raising of the head so that the chin was free from the chest enabling the patient to masticate and speak freely. With effort the head could be elevated to a normal position but he was not able to maintain it for more than a few minutes. There was moderate rotation. Pain and muscular rigidity had disappeared.

## SURGERY OF THE NERVOUS SYSTEM

**Gosset, A.: Complete Section of Left Radial Nerve; Nerve-Suture; Return of Voluntary Movement After 150 Days** (Section complète du nerf radial gauche; suture nerveuse; retour des mouvements volontaires après 150 jours). *Bull. et Mém. Soc. de chir. de Par.*, 1916, xlii, 524.

Gosset gives the details of a case of left radial paralysis operated upon by him in February, 1915, in which total section of the nerve was found and the nerve sutured. Five months later there was return of voluntary movements. He refers to two similar cases previously reported by him. W. A. BRENNAN.

**Monsaingeon: Inclusion of the Radial Nerve in a Cicatrix; Total Radial Paralysis; Liberation of the Nerve; Immediate Reappearance of Motion and Sensation** (Inclusion du nerf radial dans une cicatrice paralysis radial totale; libération du nerf; réapparition immédiate de la motilité et de la sensibilité). *Bull. et Mém. Soc. de chir. de Par.*, 1916, xlii, 408.

In the great majority of cases the result of operative intervention in lesions of the nerves have had but a temporary success, and it is only after a long interval that we can be sure of a favorable result. Lesions of this kind may be divided into two classes: those in which there is complete section necessitating suture; and those in which the continuity of the nerve is merely disturbed and its physiological functioning prevented, which only requires freeing of the nerve.

In the first class, i. e., nerve-suturing, favorable results are exceptional. In 70 interventions Walther had 19 cases of complete or incomplete nerve-section in which he was unable to note any favorable result after four months. Tuffier and Dumas stated that in 19 nerve-sutures done by them there was no recovery. The results obtained in freeing nerves and re-establishing continuity are very different. Wiarts' statistics show 24 per cent complete recovery.

Monsaingeon reports a case of a man wounded in the left arm followed by paralysis and almost complete loss of sensation. Intervention was made 68 days later. The radial nerve was found embedded in the cicatrix and freed. In less than 8 days there was a disappearance of the paralysis and a complete restoration of sensation.

Kirmisson who submits this report of Monsaingeon mentions a similar case which came under

his own observation, where after a fracture of the right humerus there was complete radial paralysis. Pressure on the cicatrix which corresponded to the point where the radial nerve passed over the external edge of the humerus was painful. After incision the nerve was easily traced and freed. At the time of reporting nearly twelve months later the patient is entirely well. W. A. BRENNAN.

**Rogers, M. H.: An Operation for the Correction of the Deformity Due to Obstetrical Paralysis.** *Boston M. & S. J.*, 1916, clxxiv, 163.

In this deformity the anterior surface of the arm and forearm are rotated inward. The operation suggested attempts to correct this deformity by doing an osteotomy of the upper portion of the humerus about two inches below the shoulder-joint, followed by a one-quarter rotation of the whole arm below the line of fracture. An incision is made between the muscle planes sufficiently long to be sure that there is no nerve involvement. J. H. SKILES.

**Edinger, L.: The Uniting of Divided Nerves** (Ueber die Vereinigung getrennter Nerven Grundsatzliches und Mitteilung eines neuen verfahrens). *Muenchen med. Wchschr.*, 1916, lxiii, 225.

Edinger has found that there is often great difficulty in the union of the ends of severed nerves. The regenerated nerve-fibers which are thrown out by the ganglion cells can easily be diverted from their course by any mechanical obstruction, such as a blood-clot, and union between the stumps can therefore be prevented. He shows that this is the case by his own observation and those of others whom he quotes.

The only way that the regenerated fibers may be kept in the proper direction to effect union is to permit them to grow in a tube. Nevertheless the attempts made to grow nerve-fibers in tubes by previous workers did not give good results because it was necessary for the fibers to be surrounded in the tube by a suitable environment for growth. The various experiments of Edinger demonstrated that human nerve-fibers grow best when the two disunited ends are inserted in an artery filled with agar jelly. This is the new procedure which he advocates. A number of such tubes have been prepared and distributed for use to operating neurologists.

Etinger has seen the results obtained by Ludloff and Hasslauer with 14 patients treated in this manner, in which cases the distance between the dis-united nerve-ends varied from 5 to 15 cm. In every case there was clear evidence of good progress of regeneration in the nerve. Within a few weeks

the anæsthesia area became much reduced. He mentions particularly a case in which 10 cm. of the tibial and 8 cm. of the popliteal nerve had been resected. After inserting the agar jelly tube the return of the plantar reflexes was demonstrable after 16 days.

W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESES, ETC.

**Byford, H. T.: The Etiology and Prophylaxis of Cancer.** *Illinois M. J.*, 1916, xxxix, 81.

The author presents a few fairly well established facts that have led him to draw certain conclusions with regard to the etiology, and from these conclusions to formulate such recommendations of a prophylactic nature as they may seem to justify.

We are justified in assuming, for argument's sake, that carcinoma is an infection and that it will not be a waste of time to make a review of facts and probabilities on this basis.

Although carcinoma is sometimes inoculated into the skin or other external epithelial surface, it is in a great preponderance of cases introduced into the system with the food.

The human faeces are carriers of germs of carcinoma, both in individuals affected with the disease and in many who are not. The same may be said as to the faeces of the dog and the cat.

The occurrence of primary infection in the colon and upper rectum shows that the germs that get by the pancreatic secretions can survive to infect the rectum. If they reach the rectum alive they can, of course, be passed out and may find lodgment elsewhere.

Those who are most subject to carcinoma are those who work in dirt and eat the greatest variety of food. Thus chimney-sweeps, industrial laborers in large towns, city laborers, furriers, and carpenters, all of whom have a high rate of mortality, work in dirt and have not always the means nor incentive for frequent washing; while pressmen, compositors, and printers, whose working materials are protected from outside contamination, and whose surroundings are such that they can and do wash and clean up when they go to lunch and go home from work, have a lower rate.

There are probably several factors that have some influence upon the increase of cancer in recent years. The increase of railroad traffic may be supposed to have some effect in spreading infection through travel of individuals and through the enormous amount of cold storage food that is carried everywhere. Some of the travelers and some of the food must be infected.

Since duodenal ulcer is a more common lesion than gastric ulcer and yet seldom becomes infected with carcinoma, and since trypsin, which is poured

into the duodenum, also prevents continued superficial development of carcinoma on surfaces with which it is kept in contact, the question arises whether trypsin, or possibly some vegetable ferment or synthetic imitation, could not be used for the destruction of the disease or the production of immunity. Whether injections of trypsin or a similar substance into and around the carcinomatous mass, or into the afferent blood-vessels or into the colon or the general circulation could be worked out so as to be curative, is perhaps worthy of serious thought, if not experiment.

The following recommendations are suggested:

1. Carcinoma should be considered an infectious disease.

2. Precautions against the spread of the infection should be taken by the community, as well as by the individuals affected.

3. Foods, particularly fruits and vegetables, should be protected from contamination at their source and in transit.

4. The disposal of human excrement in suburban and populous rural and manufacturing districts should be such as to avoid possible contamination of the surface soil. The faeces of patients with carcinoma of the alimentary canal and pelvic organs should receive the same attention as those of patients from typhoid fever or cholera. Women should be taught the infectious nature of normal stools, with particular reference to keeping the perineum free from contamination.

5. The number of cats and dogs in populous districts should be restricted and they should not be allowed to roam about the streets by day or night. The excess should be killed. Means should be taken for the extermination of rats, mice, cockroaches, and other vermin.

6. Individuals whose occupations are known to expose them to great risk of infection from carcinoma should be taught that it may get into their systems either through the irritated skin or by way of the alimentary canal.

7. All epithelial areas affected with chronic irritation and erosion should be attended to. An attempt might also be made to prevent infection of ulcerated and eroded surfaces in the alimentary canal. Patients with such lesions should avoid all unsterilized food that might be contaminated.

8. Municipal authorities should put carcinoma upon the list of diseases to be reported in order that the patients may be traced and taught how to take



care of themselves and their infected discharges, and that none of those living with them be allowed to handle foodstuffs for the market.

9. The blood of patients with carcinoma should be exhaustively studied with reference to the discovery of something that will increase immunity.

10. The time would seem to be ripe for teaching the public something concerning the erroneous notions about diet that are prevalent among the idle rich and prosperous poor in order that they may stop manufacturing the serious forms of gastrointestinal disease that have of late years shown such an alarming increase in frequency, the seeds of which are shown in adolescence and the fruits of which are harvested at maturity and in senescence.

11. Women who have not borne children for several years should be warned of the danger of developing carcinoma and should not only be on the lookout for symptoms, but should submit to a pelvic examination at least twice a year until it is evident that the mucous membranes are healthy and are remaining so.

EDWARD L. CORNELL.

**Moullin, C. M.: The Classification of Tumors.** *Ann. Surg., Phila.*, 1916, lxiii, 257.

The great variety of tumors makes their classification difficult and, according to the author, no previous classification can be said to meet all the requirements. Instead of classifying tumors on the basis of malignancy, structure, or origin, the author submits what he believes to be a better classification.

Using the word in its ordinary acceptation, tumors are divided into two classes. One is due to the reproductive power that all tissues naturally possess when suddenly aroused into action; the other, to changes that should take place in development not being efficiently carried out. The power of reproducing their like directly, without assistance from any other source, is the common property of all living things and all parts. The extent to which they make use of this power furnishes the most satisfactory basis for the classification of tissues and of the tumors that grow from them. At a very early period of development one group of cells is marked off for reproduction, the germ cells. The rest of the cells, known as the somatic cells, become specialized for other kinds of work and gradually lose their reproductive power. Each cell as it develops passes through all the stages through which its ancestors passed in the course of evolution. The structure of a tumor depends upon the parent stem, and always resembles it though it is never so perfect. Malignancy of the tumor depends, then, upon the maturity of the parent cell at the moment the bud began to grow. If the parent cell has already reached the adult age, the bud will increase proportionately slow, pushing the surrounding structures to one side instead of invading them. There is no separate class of malignant tumors, rapidly growing malignant forms occurring in all classes.

Under the head of tumors of the germ organ and

its derivatives, the author has included fœtus, internal teratomata, ovarian dermoids, and ovarian adenomata. The classification of tumors that grow from the somatic cells depends upon that adopted for the tissues themselves. Every organ and every tissue has its own kind of tumor. Tumors of the thyroid may resemble those of the prostate, but behave very differently.

Tumors due to errors in development differ from those caused by the sudden awakening of the reproductive power of the tissues in that they do not possess an independent existence and do not belong to the same generation as the structures from which they grow or to the next. Premature arrest of development is one of the most important causes of tumor formation. This not only involves the progressive advance of tissues, but the disappearance of those which have ceased to be of use. This group includes such tumors as the meningomyelocele, caused by failure of the medullary groove to close at its proper time, and also those tumors developing from the remains of the hyolingual duct, or the wolffian ducts, or wherever tissues have failed to disappear in the evolution of the organism.

GATEWOOD.

**Allan, A. P.: Phantom Tumors.** *Clin. J.*, 1916, xlv, 54.

The typical phantom tumor is resonant and smooth, conforming to that muscle or group of muscles with which it is associated; it is always resonant, but less so than the neighboring parietes. It is said to disappear during sleep, but it does not invariably do so. Pain is absent, though some cases run into a cramp, in which case the pain is intense.

The author reports two cases, both in women. In one the tumor was due to a contraction of the right rectus muscle. This patient recovered under suggestion. The second was due to a dilated cæcum following mucous colitis. It disappeared.

The treatment is to remove any factor of irritation that may be present or, if due to occupation, consider the condition for a remedy. Galvanism and massage have proved useful and purely neurotic cases respond excellently to "suggestion." It is well to bear in mind "protective phantom tumors" and to seek for the cause in deeper or other organs.

EDWARD L. CORNELL.

**Roberts, J. B.: A Further Note on the Etiology of Surgical Scarletina.** *Tr. Am. Surg. Ass.*, Washington, 1916, May.

The author states his belief that true scarlatina sometimes occurs by the introduction of the infecting agent through a breach in the skin instead of by the usual faucial or nasal route; and in his opinion there is reason to believe that the difficulty in isolating the infecting organism is probably due to its ultramicroscopic size and its filterable nature. He also suggests that the anginose affection, termed scarlatina, may cover more than one specific infec-

tion. This last opinion is based upon the confusion which has long existed between similar infections such as typhus and typhoid fever, malarial and yellow fever, and other well-known infections with similar symptoms. Reference is made to the papers of McCarty and Hamilton. He believes that many cases of so-called post-operative scarlet fever are probably of septic origin or are due to vasomotor influences. Instances doubtless occur where the true scarlatinal affection is simply a coincidence in a patient already suffering from a wound received about the time of exposure to the infection.

The cases are cited of Strickler, who about 20 years ago inoculated children with saliva of scarlet fever patients in the hope of producing immunity. Strickler believed that he actually caused acute scarlet fever by introducing the infection through a wound in the skin. The latest investigation of the etiology of this disease known to the author is that of Mallory and Medlar of Boston who found a gram-positive bacillus which they thought to be the true causative agent.

#### SERA, VACCINES, AND FERMENTS

**Gellhaus: Some Observations Regarding Collargol Injections in Small Doses** (Einige Beobachtungen bei Kollargolinjektionen in kleinen Dosen). *Muenchen med. Wchnschr.*, 1916, lxxiii, 191.

The author draws attention to the efficacy of small intravenous injections of collargol in infective diseases. In his earlier cases he used a 2 and 3 per cent solution, but in his recent practice he has reduced the strength to 1 per cent and in the case of children to 0.5 per cent.

He has treated altogether 143 cases of different inflammatory types with collargol. These include appendicitis, peritonitis, gonorrhœa, pneumonia, etc. As a general rule good results are obtained when collargol is injected in the early stages of the inflammatory process. The action of collargol is found to be powerless only when the infection is of a high degree of virulence.

Of the cases treated, 34 were cases of appendicitis. Of these, operation was necessary in 6. Of the others, 1 died and 27 recovered with 2 cases of relapse. The early use of collargol not only facilitates the results of operation when such is necessary for inflammatory conditions, but it may obviate operation altogether.

W. A. BRENNAN.

#### BLOOD

**Rous, P., and Turner, J. R.: The Preservation of Living Red Blood-Cells in Vitro; Methods of Preservation.** *J. Exp. Med.*, 1916, xxiii, 219.

The authors state that there is practically no mention in the literature of attempts to keep red blood-cells alive for a long time *in vitro*, notwithstanding the great practical advantage that such a method would afford. They believe that red blood-cells could be used for serum reactions, or for cul-

ture media, or even under certain circumstances for transfusion.

For their experiments they made use of the cells of the rabbit, dog, sheep, and man. They seem to have proven conclusively that if washed red cells are to be properly preserved they must be protected during washing, and that plasma cannot be used for this purpose. They found that gelatin in one-eighth to one-fourth per cent in Locke's solution protected cells absolutely against injury during washing and even during prolonged shaking. This injury may express itself in hæmolysis only after the cells have been kept for some days. They found it greatest in the case of dog corpuscles, and well marked in sheep and rabbit cells. The fragility of the red cells, as indicated by washing or shaking them in salt solution, they state, is different, not only for different species but for different individuals. It varies independently of the resistance to hypotonic solutions. The authors point out that the protection of fragile erythrocytes during washing is essential if they are to be preserved *in vitro* for any considerable time. The addition of a little gelatin—one-eighth per cent—to the wash fluid was found to suffice for this purpose, and by its use the period of survival in salt solutions of washed rabbit, sheep, and dog cells was greatly prolonged.

Though gelatin acted as a protection for red cells they did not find it preservative of them in the real sense. Cells did not last longer when gelatin was added to the fluids in which they were kept. Locke's solution, though probably better than Ringer's solution, or a sodium chloride solution, as a medium in which to keep red cells, was ultimately harmful. The addition of innocuous colloids did not improve it. But the sugars, especially dextrose and saccharose, had, the authors state, a remarkable power to prevent its injurious action, and possessed, in addition, preservative qualities. Cells washed in gelatin-Locke's solution and placed in a mixture of Locke's solution with an isotonic, watery solution of a sugar remained intact for a long time—nearly two months in the case of sheep cells. The kept cells went easily into suspension free of clumps, they passed readily through paper filters, took up and gave off oxygen, and when used for the Wassermann reaction behaved exactly as did fresh cells from the same individual. The best preservative solutions, the authors state, are approximately isotonic with the blood serum. If the cells are to be much handled gelatin should be present, for the sugars it was found did not protect against mechanical injury.

GEORGE E. BEILBY.

**Morris, W. H.: Secondary Hæmorrhage in Military Surgery.** *Mil. Surgeon*, 1916, xxxviii, 131.

The inefficiency of accepted methods of controlling wound infections has been one of the surgical surprises of the present war. Almost every case is infected, many of them seriously. Serious complications frequently arise and one of the most serious is secondary hæmorrhage.



Secondary hæmorrhage may originate from one of several causes: (1) A thrombus closing the end of a severed vessel may become infected, digested, and hæmorrhage result. (2) A vessel wall may be contused and hæmorrhage occur only after sloughing has occurred. (3) An intact vessel wall may be eroded by direct extension of a sloughing infection from neighboring tissues. (4) A spurious aneurism may have its sac wall infected and rupture occur.

Other factors besides infection which may lead to secondary hæmorrhage are: (1) a hæmorrhagic diathesis may exist; (2) the jolting and jarring incident to transportation may excite hæmorrhage; and (3) a foreign body in the wound may cause hæmorrhage by eroding the vessel wall.

The onset of secondary hæmorrhage is usually sudden and the patient may be found in collapse, lying in a pool of blood.

The treatment should attempt the control of the hæmorrhage and the resuscitation of the patient. The control of the hæmorrhage may be secured by ligation of the bleeding vessel as far above the area of infection as possible. Frequently, however, recurrent hæmorrhages occur and usually amputation, if the bleeding vessel be in a limb, as high as necessary, is undertaken. The resuscitation of the patient is effected chiefly by normal saline hypodermoclysis and blood-transfusion.

The author reports five cases coming under his own observation and gives a complete history of each case.

J. H. SKILES.

**Hess, A. F.: The Blood and the Blood-Vessels in Hæmophilia and Other Hæmorrhagic Diseases.**  
*Arch. Int. Med.*, 1916, xvii, 203.

Hess believes that the group termed "the hæmorrhagic diseases" includes a large number of abnormal conditions, and that, at the present time, it is a fruitless task to attempt to unravel the various entities embraced by the clinical conditions which are assembled under this general head. This he considers as due partly to the fact that the physiology of the coagulation of the blood is still incompletely understood, partly because of the impossibility of analyzing the various factors concerned in coagulation, and in part because these hæmorrhagic states have been incompletely observed from a clinical point of view.

In this investigation, therefore, the author considers the condition of purpura rather as an entity and compares it to hæmophilia. The main points in his study may be summarized as follows:

The coagulation time of the plasma in hæmophilia at times may become normal without the occurrence of hæmorrhage or other apparent change in the condition of the patient.

The estimation of the number of blood-platelets is of great value, as has been found by others, in differentiating between purpura and hæmophilia. In some cases of purpura, the platelets are abnormal and may be differentiated, like other macrocytes

and microcytes of the blood, into macroplatelets and microplatelets.

The puncture test — the reaction following subcutaneous puncture of the skin — is an aid to diagnosis. In hæmophilia a hæmorrhagic area rarely results from this procedure; in purpura it is the rule.

The capillary resistance test is also of value. By this is understood the reaction following the application for a definite period of a tourniquet to the upper arm. In purpura, this results in petechial hæmorrhages on the forearm; in hæmophilia the effect is negative.

There is an hereditary purpura as well as an hereditary hæmophilia. This type of purpura should be more generally recognized, so that these cases will not, on account of their hereditary history, continue to be regarded as hæmophilia.

The male member of a family may be a "bleeder" of the hæmophilic type and the female of the purpuric type. Two families are described in which one member suffered from hæmophilia and another from purpura.

Hæmophilia may be atypical: A case is reported which showed a calcium deficiency, as borne out by various chemical and clinical tests (hæmophilia calcipriva).

In some cases manifesting hæmorrhage, the vessels seem to be involved. This weakness is encountered in children and may be congenital; it may appear in the course of an infectious disease, or of a nutritional disorder, such as infantile scurvy.

In the classical case the differentiation between hæmophilia and purpura is simple. The picture of a typical hæmophilic is a male, with a hereditary history of bleeding, whose blood manifests a definite delay in coagulation time, whose platelets are normal in number, "bleeding-time" not increased, who shows no hæmorrhagic reaction following subcutaneous puncture of the skin, and a negative capillary resistance test. A typical case of purpura is found to be quite different: the patient may be a male or a female; the plasma coagulates in almost normal time and the number of blood-platelets is decreased (frequently below 100,000 in number); there is definite subcutaneous hæmorrhage, following puncture of the skin; an increase of the bleeding time; and the development of a large number of petechial hæmorrhages following the application of a tourniquet.

GEORGE E. BEILBY.

**Meyer, W.: The Conservative Treatment of Gangrene of the Extremities Due to Thromboangiitis Obliterans.** *Ann. Surg.*, Phila., 1916, lxiii, 280.

After a discussion of a number of cases which the author has treated conservatively with most encouraging results, and a review of the various methods of treatment of both acute and chronic gangrene of the extremities, the author discusses in detail that type due to thrombo-angiitis obliterans. He believes that conservative treatment should always be instituted before an amputation



is considered. If gangrene has begun, it is obviously impossible to replace what is dead. The progress may, however, be stayed; old obstinate ulcers may heal, and otherwise uncontrollable pain can be relieved.

Conservative treatment consists in the use of superheated air, or Bier's hyperæmia. This is best combined with systematic hypodermoclysis of Ringer's solution. If these simpler methods prove of no avail, conservative operative measures are indicated; viz., tying of the femoral vein or arterio-venous anastomosis. Both of the latter methods should be subjected to further careful clinical research as to their real value. Superheated air treatment may bring improvement of the symptoms, but a lasting beneficial effect is rarely seen. It seldom controls the pain. The systematic hypodermic injection of 400 to 500 ccm. of Ringer's solution (Matesima-Koga) daily, or every second or third day, deserves a definite place in the conservative treatment. Its effects may be lasting or temporary, but if temporary, repetition usually again brings improvement. Two such series of injections represent a sufficient test as to their usefulness. Internally, a simultaneous administration of organotherapeutic preparations deserves a careful test. Since women seem to be immune to the disease, it has been suggested that something in their system protects them, and for this, if for no other reason, extracts of organs should be given a trial.

Inflammation of the wall of the blood-vessels of the next higher group to the capillaries, arterial as well as venous, seems to be responsible for the thrombosis (Buerger). Its cause may be microbic, but the fact that women are immune again seems to argue against this. The increased viscosity of the blood, viz., blood that is thicker than normal, seems to play an important rôle in the etiology of the disease. It is possible that an altered quality of the blood as such represents a cause for the occurrence of the thrombosis and the subsequent gangrene. On the basis of this reasoning, procedures which tend to reduce the coagulability of the blood within the body deserve to be tried in an effort to find the underlying cause of the trouble. Intravenous injections of anticoagulating substances, such as a 2 per cent watery solution of sodium citrate, may prove to be a useful adjuvant to the systemic hypodermic administration of Ringer's solution.

GATEWOOD.

**McLean, A.: Venous Thrombosis and Embolism, Its Cause, Significance, and Consequences.**  
*Penn. M. J.*, 1916, xix, 318.

The author describes some experiments on dogs undertaken to explain the cause of the thrombotic process which occurs, for instance, as a femoral thrombosis following an apparently clean appendectomy, where the common etiological factors, such as: (1) trauma to the intima, (2) stagnation or

slowing of the blood stream, (3) chemical changes in the blood, and (4) infection, are wanting.

He was impressed with the tremendous amount of injury a vein could withstand without the formation of a thrombus at the site of the injury.

The following phenomena were noticed in the course of the experiments:

1. When a vein is ligated in continuity, the blood in the vein will clot only on one side of the point of ligation, that is, the side from which the blood is coming.

2. In ligating a vein between two ligatures (two inches apart) the blood between the ligatures clots very slowly, and if left for a week or more the contents of the ligated vein will have completely disappeared, a fibrous cordlike structure alone remaining.

3. The same result is accomplished by ligating an artery between two ligatures.

4. Simple crushing of a vein will not cause a clot at the point of crushing. The crushing can be repeated in forty-eight hours and a clot will not form at the site; examination of the repeatedly crushed vein two weeks after the last crushing, will show a thickening of all the coats of the vein, the intima remaining smooth and glistening.

5. Crushing the vein with the subsequent introduction of a 24-hour bouillon culture of staphylococci, and again crushing the vein, grinding the staphylococci into the vein wall, did not produce a clot or thrombus at the site of the crushing or the injection of the bacteria.

6. The introduction of a sterile thread into the lumen of a vein, allowing one-half to three-fourths of an inch to be suspended inside the vein, failed to produce a clot or thrombus.

7. The same experiment was negative in the artery, allowing the thread to remain four, five and seven days.

8. Thread infected with staphylococcus albus or aureus will cause a thrombus in three or four days.

9. Thread infected with colon bacillus or staphylococcus aureus introduced into an artery caused the formation of a firm clot.

10. Sterile thread one-half and one inch long "let go" in the circulation caused no symptoms.

11. Infected thread (colon bacillus) "let go" caused death in three and one-half days. Thread infected with blood-clot recovered in the right lung.

In reviewing his records of the past two years in 1,610 laparotomies, thrombosis and embolism followed in 33 cases, 2.2 per cent. There were 9 fatal cases of embolism. There were 3 cases of pulmonary embolism followed by abscess and recovery; 2 of hepatic embolism, followed by abscess with one recovery; 2 of cerebral embolism followed by death. There were fifteen cases of femoral thrombosis following pelvic operations.

It is worthy of note that in all the cases of embolism and thrombosis in the entire series, there was only one case of embolism with recovery, and no cases at all of thrombosis, that followed operations in the upper abdomen.

LUCIAN H. LANDRY.



**Painter, C. F.: The Operative Treatment of Thrombo-Angiitis Obliterans.** *St. Paul M. J.*, 1916, xviii, 41.

The author cites a number of cases that have come under his observation, which he puts in the classification so well described by Leo Buerger.

All of his cases were in young Russian Jews. Occupation can not be traced as a causative factor as his cases are found in many different callings. However, his observations coincide with Erb's, in so much as excessive cigarette smoking and inveterate tea drinking has been noticed in all his cases. The unstable nervous system of the Jewish race as a whole may play a part in this condition, as almost all of his patients have been temperamentally neurotics.

The patients complain of disagreeable sensations in the feet and sometimes in the calves of the legs; this increases to pain and is associated with a congestion of the toes, which extends to the dorsum of the foot, possibly as high as the malleoli.

A dependent position of the foot aggravates this congestion and the pain is more severe and of a burning character the longer the foot is allowed to hang. Pain and congestion are appreciably lessened by elevation. Anterior and posterior tibial pulse is very feeble or absent. Gangrenous areas may be noted, if the caliber of the vessel is sufficiently encroached upon.

Pseudo-arthritis are quite prevalent among the Jewish people, as described by Solis-Cohen. A certain amount of apparently bona fide capsular thickening gradually develops, even in these purely functional or neurotic joint disturbances. If such actual physical changes can take place in and about joints as the result of a non-inflammatory condition, the author advances the hypothesis that given the activity of a similarly disturbed nervous mechanism in the peripheral vessels of the extremities, one might expect to find these vessels occupied by a thrombus which would attach itself to the walls and organize into connective tissue, thus narrowing or occluding the lumen of the vessels.

The author is in favor of conservative treatment rather than amputation, especially in the early cases. This treatment consists in rest; elevation of the limb, combined with keeping it well wrapped in cotton wool; discontinuing the use of tobacco, alcohol, tea, etc.

This necessarily means a long tedious treatment, but with sufficient means or hospital facilities, the end-results justify the sacrifice of time.

LUCIAN H. LANDRY.

**Lindeman, E.: Reactions Following Blood-Transfusion by the Syringe Cannula System.** *J. Am. M. Ass.*, 1916, lvi, 624.

Lindeman states that the syringe cannula system has greatly simplified the procedure of blood transfusion, which now occupies a prominent and permanent place in therapeutics. In the first 150

transfusions by his method, chill, followed by fever, occurred in approximately 33 per cent. He has found that hæmolysis never occurs without chills and fever, unless the patient dies during, or shortly after, the transfusion. He infers therefore that chills and fever in transfusion are due to hæmoglobin set free in the circulating blood. If the hæmoglobin set free is abundant, it appears in the urine; when the amount is moderate hæmatoporphyrin appears in the urine; when hæmolysis is slight no blood pigment appears in the urine.

In this series of 150 cases, the preliminary blood-tests for hæmolysis and agglutination were conducted by different serologists. In every case in which hæmolysis occurred and in which preliminary tests had been made, Lindeman had the test repeated later, and in each instance incompatibility was detected in the second examination. He infers that there was error in the primary examination and has set himself the task of eliminating this error by personal supervision of the laboratory work and of developing refined methods of selection so as to prevent even a slight degree of hæmolysis, of which the only manifestation is chills and fever.

His technique for testing for hæmolysis and agglutination are as follows: The red blood-cells of the patient and donor are washed three times with normal saline; variable quantities of patient's serum are placed in three separate small test-tubes; to each of these are added 0.25 ccm. of a 2 per cent suspension of washed blood-cells of the donor. The same is done with the donor's serum and the patient's cells. Controls are made of donor's serum and donor's cells—patient's serum and patient's cells. Controls are also made with donor's cells in normal salt solution and patient's cells in normal salt solution. The total volume in each tube is raised with normal saline to 0.5 ccm. of volume. The test-tubes are incubated in a water bath for a period of two hours, and readings are made. They are then set in the ice-box over night and readings are again made the following morning. When a case is urgent, the ice-box test is eliminated.

In the last 155 transfusions performed by the syringe cannula system with personally supervised preliminary tests no case of hæmolysis, and no death referable to transfusion, occurred. Chills followed by a rise in temperature occurred in sixteen instances. Adults received from 1,000 to 1,800 ccm. in each transfusion, and the quantity enumerated was always taken from one donor. No foreign substance or anticoagulant was employed in any case.

In the syringe cannula method of Lindeman, the entire mass of blood is outside the body for a period of from six to ten seconds, regardless of the amount transferred. It passes through a minimum amount of foreign material. Embolism or clotting never occurs in transit. Syringes are cleaned as fast as used. Clotting in the syringe can not occur, and the blood is transferred uninjured exactly as it exists in nature. There are no stopcocks, valves, or



rubber tubings about which blood may clot, and there is no blind system into which air may leak.

His conclusions are as follows:

1. The preliminary hæmolytic and agglutination tests when properly performed are reliable.

2. Incidents of hæmolysis in transfusion can be eliminated entirely.

3. The reactions which follow transfusion when accurate tests are made are eliminated in all except 9 per cent of the cases. In this 9 per cent, chills and fever alone occur. When the quantity is 800 ccm. or less, chills and fever do not occur.

4. By careful, accurate, and complete hæmolysis and agglutinin tests, when work is done skilfully, blood-transfusion is robbed of all danger attending its use.

ALBERT EHRENFRIED.

**Cherry, T. H., and Langrock, E. G.: The Relation of Hæmolysis in the Transfusion of Babies with the Mothers as Donors.** *J. Am. M. Ass.*, 1916, lvi, 626.

Cherry and Langrock consider that hæmorrhagic disease of the newborn is one of the most frequent and alarming of the diseases in combating which transfusion is required. The subcutaneous injection of animal or human serum (Welch) or of whole blood (Schloss) has been used with a considerable degree of success, but there have also been a great many failures. The transfusion of blood, however, has given highly gratifying results.

On account of the close relationship of the maternal and foetal bloods *in utero*, it is a natural supposition that complete compatibility of infant's and mother's blood should exist. In order to establish this fact, the authors have performed a series of hæmolytic tests in 34 instances upon newborn babies and their own mothers. If it is known beforehand that the mother's blood is compatible, it will save delay in finding a compatible donor, in making the necessary serological tests, and in the expense which these conditions entail.

In the 34 tests carried out, no hæmolysis or agglutination occurred. Accordingly the authors conclude that all mothers can be used as donors for their infants in the transfusion of blood, provided no contra-indications exist on the mother's part.

The authors report one transfusion performed since these experiments were concluded, in which, without preliminary blood tests, 60 ccm. was successfully transferred from the mother, through the external jugular vein, by the indirect syringe procedure of Unger. They estimate that 60 to 75 ccm. are sufficient to supply the infant with necessary elements to promote clotting, and to replace those lost by hæmorrhage. They recommend the indirect method for its simplicity.

ALBERT EHRENFRIED.

**Rous, P., and Turner, J. R.: The Preservation of Living Red Blood-Cells in Vitro; Transfusion of Kept Cells.** *J. Exp. Med.*, 1916, xxiii, 239.

Having described in a previous paper the methods whereby red blood-cells may be kept intact for

long periods *in vitro*, Rous and Turner have undertaken to determine whether cells kept according to these methods were alive in the sense that they were capable of functioning in the animal body. This they have attempted to determine by transfusion of the kept cells in bulk with appropriate control. They have performed many such experiments, using rabbits.

In order to determine the availability for functional uses of red cells kept *in vitro* by their methods, transfusion experiments were carried out with rabbits by which a large part of their blood was replaced with kept rabbit cells suspended in Locke's solution. It was found that erythrocytes preserved in mixtures of blood, sodium citrate, saccharose, and water for 14 days, and used to replace normal blood, remained in circulation and functioned so well that the animal showed no disturbance, and the blood count, hæmoglobin, and percentage of reticulated red cells remained unvaried. Cells kept for longer periods, though intact and apparently unchanged when transfused, soon left the circulation. Animals in which this disappearance of cells took place on a large scale, remained healthy save for the progressing anæmia. The experiments proved that, in the exsanguinated rabbit at least, transfusion of cells kept for a long time *in vitro* could be used to replace the blood lost, and that when the cells had been kept too long but were still intact they were disposed of without harm. The indications are, the authors state, that kept human cells could be profitably employed in the same way.

GEORGE E. BEILBY.

## BLOOD AND LYMPH VESSELS

**Eccles, W. M.: A Clinical Lecture on Aneurisms of War Wounds.** *Am. J. Surg.*, 1916, xxx, 33.

Eccles classifies 50 cases of traumatic aneurism and emphasizes some points in regard to their treatment. Of the 50 cases, 30 were arterial and 20 were arteriovenous; 7 were of the vessels of the head and neck, 14 of the vessels of the upper extremity, and 29 of the vessels of the lower extremity. The popliteal suffered more frequently than any other vessel. There were 4 deaths in the series.

The signs of traumatic aneurisms vary somewhat from those of pathological aneurisms. The bruit is usually much more marked and the thrill is harsher. Where the clot is large the pulsation, bruit, and thrill may entirely disappear.

With regard to the treatment of traumatic aneurisms in general the author makes the following suggestions: (1) Delay operation as long as possible in order to allow time for a collateral circulation to be established. (2) Always be prepared for profuse hæmorrhage. (3) Make a long incision in order to secure an abundance of room.

The methods of dealing with traumatic aneurisms are three: ligation of vessels, operations on the sac, and amputation.

The application of ligatures to the artery on the



proximal and distal sides of the aneurism is quite the best method of treatment. A ligature on the proximal side alone is uncertain in its results and may not control the bleeding. The ideal method of treatment is to apply a tourniquet, open the sac, pass a probe into each communicating vessel and ligate each one externally, but it is not altogether easy and causes a good deal of disturbance.

Amputation is required if gangrene has set in and may possibly be the safest as a primary treatment where there is a diffused traumatic arterial aneurism.

Quadruple ligation with excision of the intervening portion is the best method of treatment in arteriovenous aneurisms.

J. W. TURNER.

**Haberland, H. F. O.: The Epicrises in Wound Aneurisms** (Zur Epikrise der Schussaneurysmen). *Deutsche med. Wchnschr.*, 1916, xlii, 160.

In the case of traumatic aneurisms of the extremities it is only permissible to speak of a cure when complete functional use of the organ has been restored and provided there is no serious secondary injury.

Great caution must be observed in making the prognosis, owing to the danger of late gangrene developing; observation after operation should be continued for at least six weeks.

Early vessel-suture is favorable to early recovery. Oval suturing is to be preferred. Arteriovenous aneurisms ought always be operated upon on account of the danger of embolism. Conservative treatment will not effect an anatomic cure.

W. A. BRENNAN.

**Judd, E. S.: Cirroid Aneurism.** *St. Paul M. J.*, 1916, xviii, 48.

The author reports quite an extensive case involving the entire forehead, in which there was a large mass over the bridge of the nose, which extended into the right lids, entirely closing the eye. The dilated vessels passed back through the scalp to the occipital region. The right facial artery was considerably dilated as it crossed the border of the jaw at the anterior border of the masseter muscle.

Under ether and local anæsthesia, the right external carotid was ligated, as well as the facial, just above the submaxillary gland. The pulsation was considerably diminished in the prominent part of the angioma, but in a few days the condition was the same as before operation.

Six days later, the opposite external carotid was ligated, which practically stilled the vessels. The patient was comfortable for a few days, when the skin of the scalp over the aneurism became tense, red, and extremely painful. The scalp and tissue about the face were very sensitive. The pain was so great that morphine had to be administered freely.

Five days later, the scalp was incised from the glabella to theinion, down to the periosteum. The scalp was reflected on both sides and the dilated and thrombosed vessels were dissected out. There was

no tendency to hæmorrhage or active bleeding. The scalp was sutured. One or two separate incisions about the face and temporal region were necessary and the vessels in these regions extirpated. Sloughing occurred in one of the scalp-flaps. The convalescence was satisfactory and the patient has been doing well since the operation (March 2, 1912).

The author discusses the various forms of treatment which have been advocated by several observers, such as the ligation of the afferent vessels; the coagulation of blood by means of various injections; galvanocautery; electropuncture, etc. When the condition appears in the extremities, amputation may have to be resorted to. Some observers recommend leaving these tumors alone, unless the extension or severity of the condition endangers the life of the patient. Compression of the tumor is a simple but ineffectual mode of treatment. Ligation of the temporal and occipital, also the branches of the artery leading to the affected part, has been tried with no success.

While ligation of one external carotid may reduce the supply to the scalp, the ligation of both external carotids is more efficacious. Ligation of the common carotid is far more dangerous, especially in the aged, and is not as efficacious as the ligation of the external carotid, as the branches involved spring from the latter vessel.

Fifty-one single ligations and forty-eight double ligations of the external carotid have been performed in the Rochester clinic without a single death; while in eight cases in which one common carotid was ligated, there were two deaths.

LUCIAN H. LANDRY.

**Kuettner, H.: Experience in Injuries of the Large Blood-Vessels in War** (Meine Erfahrungen in der Kriegschirurgie der grossen Blutgefässstämme). *Berl. klin. Wchnschr.*, 1916, liii, 101.

Kuettner's experience with injuries of the larger vessels, including aneurisms, is based upon 249 cases in the Graeco-Turkish, South African, and the present wars.

Next to nerve injuries aneurisms are the most interesting to the surgeon. These classes of injuries give the greatest contrasts in peace and war. In vascular surgery, however, unlike surgery of the nerves, the surgeon can see the success or failure of his intervention at once without having to wait an indefinite period.

Injuries to the large blood-vessels are so serious and the operative difficulties so great that their treatment should be left to the most experienced and skillful surgeons. Kuettner classifies blood-vessel injuries in three groups: (1) injuries with external hæmorrhage, (2) injuries with internal hæmorrhage, and (3) complete aneurisms.

Regarding external hæmorrhages Kuettner states that the percentage of soldiers who die from hæmorrhage on the battlefield depends on the kind of battle and the class of weapon. In artillery wounds, fragments of shells and especially pieces of steel



grenades cut through the vessel like a knife and there is a large external hæmorrhage. The crushing effect even of the large modern projectiles counts for much less than the effects of splinters.

Aneurisms are more frequent with the present-day jacketed bullets than formerly. The small entrance and exit wounds make it more difficult for the blood to flow. Regarding treatment of hæmorrhage in the field the author states: In venous hæmorrhage pressure bandages are usually sufficient. Ligation is rarely necessary. In arterial hæmorrhage in about half of the cases, ordinary means—elevation of parts, pressure bandage or tampon—suffice. Of 421 arterial hæmorrhages only 201 required ligation.

When the firing is at close range death from hæmorrhage is more common. Regarding aneurisms, they rarely result from grenade splinter or shrapnel wounds which are likely to be fatal. They are rare in wounds from jacketed bullets with fracture of the large bones; they occur only occasionally when the entry and exit wounds are large.

Secondary hæmorrhages are even more important than primary. These may be the result of infection (septic erosion), or a spicula of detached bone may injure the vessel, or it may be due to pressure of a drain in the vicinity of a vessel. It is not always noticed until the patient's condition is serious. If these secondary hæmorrhages are frequently repeated, amputation may be called for. If the secondary hæmorrhage is from a main arterial trunk which is badly infected, amputation is the best course, as suturing and ligation is out of the question.

The author has found vast benefit in parenchymatous septic secondary hæmorrhage from intravenous injections of coagulen.

With regard to internal hæmorrhages, the author states that hæmatomata are usually present in all war injuries of the larger vessels. They show pulsation. Where a vein is injured, arterial blood frequently finds its way directly into the vein causing an arteriovenous fistula and the formation of hæmatoma is small.

Diagnosis of hæmatoma is usually easy, but it may be confounded with abscess. On account of the possibilities of perforation, infection or gangrene of hæmatoma, and the fact that spontaneous healing is infrequent, the author thinks active early surgical intervention is indicated.

Kuettner treated altogether 93 aneurisms, 56 of these were complete and 37 were in the hæmatoma stage; 45 per cent were arterial; 55 per cent were arteriovenous; 73.6 per cent were treated by ligation; 26.4 per cent by suture. W. A. BRENNAN.

### POISONS

**Freeman, L.: Chronic General Infection with the Bacillus Pyocyaneus.** *Tr. Am. Surg. Ass.*, Washington, 1916, May.

The author gave a brief statement of the prominent symptoms of pyocyanic infection, together with

the main facts in its pathology, and a somewhat detailed report of an instance of the more unusual chronic form of the disease, of which only a few cases have been recorded.

The author's case was an adult, who had been ill for nearly eleven months. He had a high fever of the septic type, eruptions upon the skin, severe neuralgia, serous effusions, and muscular paresis and atrophy.

During an exploratory laparotomy a cholecystostomy was done and a pure culture of the bacillus pyocyaneus recovered from the black and thickened bile. From this a vaccine was made and administered to the patient, following which the patient gradually recovered.

The features of especial interest in the case are:

1. Its extreme chronicity (nearly 11 months).
2. The typical neuralgic pains, followed by paresis and muscular atrophy.
3. The absence of the bacillus pyocyaneus from the blood and its presence in the bile. (The germ does not grow in the blood, but is merely conveyed by it, lodging and multiplying in the vessel walls. It is found mostly in the parenchymatous organs, such as the liver, spleen, and kidneys, hence is particularly apt to infect the bile.)
4. The absence of any discoverable point of infection, unless it might be the teeth.
5. Recovery following drainage of the gall-bladder and the use of an autogenous vaccine.
6. The occurrence of cirrhosis of the liver.
7. The presence of ascites and pleural effusion.
8. The satisfactory recovery after so severe and protracted an illness, with the exception of a moderate paresis of the lower limbs, which seems to be improving.

**Barling, G.: Remarks on Delayed Tetanus.** *Brit. M. J.*, 1916, i, 337.

Three cases are reported in which the incubation period varied from 50 to 53 days. In most of the cases the original wound had apparently healed before the onset of tetanus. The cause of the prolonged incubation period is unknown, although several theories are advanced. At least two of the patients reported had prophylactic doses of anti-tetanic serum, which may have inhibited the growth of the organisms or neutralized all of the toxin available during the first days after the receipt of the wound. In several of the cases a lowering of resistance seemed to precede the onset of the tetanus. J. H. SKILES.

**Abercrombie, R. G.: The Treatment of Tetanus.** *Brit. M. J.*, 1916, i, 339.

Four cases are reported in full. The effectual daily dose would appear to be 10,000 to 12,000 units. This may be given twice a day in critical cases. The major portion of this dose should be given intravenously, subcutaneous injections being also used to maintain the effect. Intrathecal injections should be given daily or at such intervals as



the symptoms demand. The dosage must be reduced gradually in order to prevent relapse.

All will agree as to the desirability of vigorous treatment of soiled wounds as a preventive of tetanus; but when once the disease has declared itself, operative surgical interference with the surface of the wound, although recommended by several authorities, is a proceeding accompanied by considerable danger. Protective inflammatory barriers would thus be broken down exposing the tissues to the tetanus toxin. J. H. SKILES.

### SURGICAL THERAPEUTICS

**McGuire, S.: The Post-Hospital Care of a Surgical Patient.** *South M. J.*, 1916, ix, 251.

The author urges the formulating of plans whereby surgical patients leaving a hospital will have their post-operative treatment superintended by the surgeon in co-operation with the family physician. Patients are not immediately cured after operation, and they need varying lengths of time to return to normal after their disease has been rectified from a surgical standpoint. The patient cannot be trusted to safeguard his own interest during this time, for the knowledge of the laity on medical subjects often seems to be in inverse proportion to their intelligence and common sense in everyday matters. Correspondence between surgeons and patients is unsatisfactory because the patient usually fails to give important facts and often either overexaggerates or underestimates his symptoms.

In the author's opinion the best results in following up post-operative cases will result from the co-operative efforts of the surgeon, family physician, and patient. The plan he suggests is somewhat as follows:

The patient, on leaving the hospital, is given a form covering the general points that will be of interest to him in his post-operative life with relation to his definite operation. He is told to report to his family physician for tonics, hypnotics, and cathartics. A description of the operation and operative findings is sent to the physician and full explanation of the case is made to him so that he will be able to intelligently direct the patient in his post-operative care.

The author finds that about 90 per cent of the ordinary hospital cases can be covered amply with regard to their post-operative care by instructions on about 12 different types of blanks, depending on the character of the operation. In about 10 per cent of cases it is necessary to enlarge on these instructions personally. HARRY G. SLOAN.

### SURGICAL ANATOMY

**Wood, F. C., and McLean, E. H.: The Effect of Phloridzin on Tumors in Animals.** *J. Cancer Research*, 1916, i, 49.

Following the report of Benedict and Lewis in 1914 of the cure of malignant tumors in rats by the

induction of diabetes with phloridzin, the experiments here described were undertaken by the authors for the purpose of ascertaining to what extent the results of Benedict and Lewis could be duplicated in large series of animals bearing the tumor with which they had worked, as well as in animals bearing other types of neoplasms.

The tumors used in these experiments were the Buffalo rat sarcoma, Crocker Fund sarcoma No. 180, and seven spontaneous mammary carcinomata of mice.

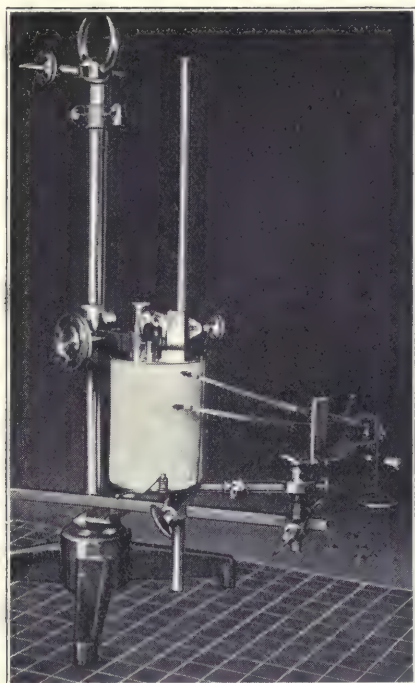
Among the mice bearing spontaneous tumors and Crocker Fund mouse sarcoma No. 180, they found no cases of absorption of the tumors under treatment. The slightly slower growth occurring in some of the treated animals bearing No. 180 they believe cannot be considered as due to the treatment, as the difference was not so great as often occurs in untreated animals from the normal variability of growth of this tumor. Ulceration, which is also more frequent among the treated animals, probably on account of the poor nutrition of the host, must be considered, they state, as a factor when comparison is made between the size of the treated and of the control tumors.

The Buffalo rat sarcoma showed a much smaller percentage of absorption among the treated animals than among the controls, 37 per cent as compared with 58.4 per cent, and in the majority of the experiments carried out by the authors the growth among the treated animals was much more vigorous than that among the controls.

Considering the very great variability of growth of the Buffalo rat sarcoma, as well as the high percentage of cases of spontaneous absorption occurring constantly, but with great irregularity, in different series of animals, the futility of using this tumor for therapeutic experiments or of basing conclusions upon such investigations, the authors believe, is at once evident, and any "cures" obtained in work with the Buffalo rat sarcoma must be ascribed to spontaneous absorption rather than to the effect of the therapeutic agent. GEORGE E. BELLBY.

**Uffreduzzi, O.: Contributions to the Experimental Surgery of the Mediastinum (Excluding the Heart).** *Am. Med.*, 1916, xxviii, 89.

Uffreduzzi reviews the various methods of operating upon the mediastinum through the pleura and the various positive and negative pressure apparatus. He describes an apparatus which is a modification of the Meltzer-Auer apparatus which he believes has the advantage of preventing the reflex of ether in the respiratory tract and of permitting the use of oxygen instead of atmospheric air, and of being applicable even to a positive-pressure mask in case intubation should eventually fail or be contra-indicated. With the aid of this device the author has been able to perform a large series of experiments upon dogs in which extensive operations were performed upon the œsophagus, the thoracic aorta, the thoracic duct, the pulmonary



The elastometer. (Schwartz.)

artery, superior and inferior venæ cavæ and the vagi and the intercostal nerves.

With an experience of more than 300 narcoses in which the author has used this type of apparatus, he states that the method of narcosis is not only excellent but is attended with the lowest mortality of any method that can be applied to animals. He states that he has never had a death during the narcosis that could be ascribed to the method even when the anæsthetic was prolonged for several hours, that the opening of both pleura is perfectly tolerated, that post-operative pneumonia is very rare, and that with this method one is able to work with almost no respiratory movement.

GEORGE E. BEILBY.

**Schwartz, A. B.: The Clinical Study of Œdema by Means of the Elastometer.** *Arch. Int. Med.*, 1916, xvii, 396.

The elastometer, an instrument devised by Schade to measure œdema, the author believes promises to change the study of œdema from a subjective one depending on the amount of pitting obtained on pressure, to an objective one whereby the degree of œdema may be expressed in exact terms. The instrument which Schade has devised consists of a disk mounted on a perpendicular tactile rod which is placed on the skin surface, with the addition of a superimposed weight. The amount of depression caused by the sinking of the weighted disk into the

skin and subcutaneous tissue is graphically transferred by a writing lever to a revolving drum, making a characteristic curve. Surrounding this tactile disk, which measures the elasticity, is a set of three similar tactile disks, which rest on the surrounding skin surface, and indicate by a separate lever on the revolving drum any movement of the central disk other than that caused by the addition or removal of the weight. This line is known as the control line, and must be straight in order to have the record of any value. Thus, faulty curves caused by disturbing factors can be eliminated by observing the control line.

Schwartz believes that with the use of this instrument, the elastometer, the study of œdema will become a more accurate one, although he thinks that with the present instrument the expression of œdema in mathematical terms is not deemed advisable, but that the character of the curves, together with the deficiency of return to the base line, would permit an approximate estimation of the intensity of an œdema.

Furthermore, he states that the instrument makes possible the recognition of slight degrees of œdema which heretofore could not be detected. Persistent evidence of elasticity loss, despite the disappearance of other signs in patients with nephritis or endocarditis, Schwartz believes, indicates the advisability of more prolonged observation in cases of this character.

GEORGE E. BEILBY.

**Ewing, J.: Pathological Aspects of Some Problems of Experimental Cancer Research.** *J. Cancer Research*, 1916, i, 71.

The numerous experiments that have been conducted in this field seem to the author to point to the necessity of regarding all forms of neoplasms as specific diseases, connected only by the fact that they are neoplastic in greater or less degree, but differing in their etiology, clinical course, and therapeutic possibilities. The habit of regarding cancer as a protean disease of uniform significance, the author believes may well be abandoned in the interests of progress, and when cancer research properly occupies itself in the study of the distinctive features of different cases of malignant disease, especially, he states, when it abandons the idea of a universal cure for cancer, it will be in accord with sound pathological sense. It will then not be necessary, he thinks, to talk wisely to the public about the obscurities of cancer etiology, or to speculate about why cells grow lawlessly. Concerning the ultimate nature of neoplastic overgrowth, he says, we shall never have more than a descriptive knowledge.

GEORGE E. BEILBY.

**Haskins, H. D.: The Uric Acid Solvent Power of Urine After Administration of Piperazine, Lysidin, Lithium Carbonate, and Other Alkalies.** *Arch. Int. Med.*, 1916, xvii, 405.

In a recent paper Haskins reported the results of an investigation of the uric acid dissolving power of



hexamethylenamine. He showed that the mode of action of that drug was quite different from that of the rest of those substances which have been classed as "uric acid solvents." He states that these latter, if they act at all as solvents, do so by virtue of being basic substances. His purpose in this paper is to report an investigation of the solvent power of the most important members of this class.

The organic compounds which he studied were piperazine and lysidin which are amine derivatives, and the nitrogen of their molecules imparts to these substances a basic character so that they combine with acids. These substances are supposed to form salts with uric acid which are very soluble. The other compounds which he studied were lithium carbonate, sodium citrate, and sodium bicarbonate, which are supposed to act as alkalies to uric acid forming lithium and sodium urates which are quite soluble. The conclusions which the author forms from his study are as follows:

1. Piperazine can cause the urine to dissolve an increased amount of uric acid, and this effect is most marked if sodium citrate or bicarbonate be also given and if diuresis be avoided.

2. Lysidin can act as a uric acid solvent but is not a practical therapeutic agent because of the large doses required.

3. Lithium carbonate is a uric acid solvent if large enough doses are used, but is unsafe and possesses no advantage over sodium citrate or bicarbonate.

4. Sodium citrate and bicarbonate are reliable and satisfactory uric acid dissolving agents when given in such dosage as to keep the urine alkaline.

GEORGE E. BEILBY.

## RADIOLOGY

**Bacmeister, A.: The Results of Combined Mercury-Lamp and Deep X-Ray Treatment of Human Lung Tuberculosis** (Die Erfolge der Kombinierten Quarzlicht-Röntgentherapie bei der menschlichen Lungentuberkulose). *Deutsche med. Wchnschr.*, 1916, xlii, 99.

The favorable results obtained in deep X-ray treatment of experimentally produced tuberculosis of the lung in animals have justified the extension of this method to the human subject. Kuepferle has recently reported on 44 cases in different stages treated by deep X-ray. In 19 cases in the first stages he got good results; he also got good results in 14 partly disseminated partly confluent cases; no permanent improvement was observed in 11 cases in the third stage.

Bacmeister's experience is confined to 20 cases of stationary to latent phthisis, subjected to one month's treatment. In 9 of these all symptoms have disappeared and in the others there were good results.

In a second group with fever, and with chronic progressive symptoms, but without caseous exudate, he counts 10 clinically cured patients. Of 23 patients

of this group in which there was no complete cure, 19 have been much improved.

Bacmeister abstains from the treatment of patients with high fever and rapidly progressive symptoms. As in the case of animals Bacmeister thinks that the good effects of the X-ray treatment is not due to any effect on the bacillus, but to the effect on the granulation tissue which is destroyed and replaced by cicatricial tissue. He thinks that combined with hygienic measures roentgen therapy combined with mercury-lamp treatment of lung tuberculosis has proved itself a valuable method in the limited number of cases in which it has been applied.

W. A. BRENNAN.

**Kuepferle and Bacmeister: Experimental Grounds for Treatment of Lung Tuberculosis by X-Rays** (Experimentelle Grundlagen fuer die Behandlung der Lungentuberkulose mit Röntgenstrahlen). *Deutsche med. Wchnschr.*, 1916, xlii, 96.

The authors instituted a series of experiments to determine the effect of hard filtered X-rays on experimentally produced lung tuberculosis in rabbits. The conclusions which they draw from these experiments are that a beginning experimental tuberculosis of the lungs may be suppressed, and an established tuberculosis may be healed.

The effect of the raying is to transform rapidly growing tuberculous granulation tissue into cicatricial tissue. It has no effect on the tubercle bacillus.

Small doses of rays at long intervals have little effect; very large dosage, without sufficiently long reaction intervals, may give rise to bronchitis and bronchopneumonia.

In animals a dosage of 20 to 23 at 3 to 5-day intervals effected healing. The mercury-lamp had no direct influence on lung tuberculosis.

On the basis of their experimental findings, the authors have introduced X-ray therapy for lung tuberculosis in the Freiburg Medical Clinic.

W. A. BRENNAN.

**Hammes and Schoepf: Exact Localization of Foreign Bodies by Means of Roentgen Rays** (Zur genauen Localization von Fremdkörpern mittels Röntgenstrahlen). *Deutsche med. Wchnschr.*, 1916, xlii, 252.

The authors describe the technical details of an apparatus to put into practice results obtained from certain mathematical equations which give the position of a foreign body located in the body. They claim that location can be obtained in a few minutes and that probably their method is superior to the many procedures described by others.

W. A. BRENNAN.

**Wintz, H. and Baumeister, L.: The Proper Filter for Deep Roentgen Therapy** (Das zweckmaessige Filter der Röntgentherapie). *Muenchen med. Wchnschr.*, 1916, lxiii, 189.

The authors made a series of experiments to determine what was the best material and most

suitable thickness of a filter for deep roentgen treatments. Experimentation with various metals showed that the most favorable results were obtained with an aluminum filter 3 mm. thick and with a zinc filter 0.5 mm. thick.

To obtain an equal dosage on the skin with aluminum and zinc filters the exposure in the case of zinc must be three to three and one-half times as long as with aluminum; but at a depth of 8 to 10 cm. the ratio is reduced to 1:2. At this depth when using the thicker zinc filter by doubling the strength of the rays, the same dose can be received on the skin as with the thinner aluminum filter. The advantage is that a dosage which with an aluminum filter would reach the erythema limit may be doubled by using a zinc filter. The authors prefer the zinc filter to any other.

W. A. BRENNAN.

**Case, J. T.: Roentgen Treatment of Deep-seated Cancer.** *Physician & Surg.*, 1915, xxxvii, 442.

Case states that in general it must be admitted that the X-ray treatment of deep-seated carcinoma has not up to the present time gratified the fond hope with which the discovery of this method was so fervently greeted.

In superficial carcinoma where there is deep ulceration with involvement of the neighboring glands, etc., a very thorough-going preliminary pre-operative roentgenization should be administered. On the ninth or tenth day a radical operation should be performed followed later by another X-ray treatment. By combining roentgenization with surgical intervention one is most likely to insure good results.

Discussing the question as to whether operable carcinoma shall be treated by irradiation or operation, Case states that the results which have thus far followed roentgentherapy of deep-seated malignant affections do not warrant the belief that roentgentherapy affords a means of cure in these deep-seated lesions. In the light of our present knowledge it may be stated as an axiom that the X-ray method should never replace or in any way interfere with the surgical treatment of cancer.

In looking over the literature of competent authors it is seen that in about 25 to 30 per cent of the cases of uterine carcinoma, the results of roentgentherapy are very satisfactory from a palliative standpoint; but as yet Case has not seen an instance of definitely proven cure of pelvic cancer following the application of roentgentherapy.

In mammary carcinoma good palliative results are nearly always the rule.

The good palliative results which have followed the X-ray treatment of recurrences and inoperable cases warrant the adoption of post-operative X-ray treatment as a routine in malignant cases.

The treatment should be applied as soon as possible after operation and as thoroughly as though the disease was still present in its entirety.

Case's technique in operable cases is to submit the patient eight or ten days before operation to cross-fire filtered rays in full dose in as many areas

as possible. Ten days after operation the patient is again submitted to a further series of treatments administered as though the tumor were still present.

HOLLIS E. POTTER.

**Hanford, C. W.: Some Radium Physics.** *Chicago M. Recorder*, 1916, xxxviii, 143.

The author states that the high aim of the radio-therapist should be to direct the radium rays to the deep tissues where the disease is located, with the least injury to the healthy structures; and that in many instances where results have not been obtained from their application, failure may be traced to a lack of knowledge of certain physical facts that had not been observed by the operator. A number of examples are given, such as where a tube of radium has been used supposed to contain a given amount of radium element, is tested after repeated failure, and found to contain only a very small amount, entirely inadequate for the purpose. Methods are reviewed which if carefully observed will save the operator from such errors.

W. S. NEWCOMET.

**Wood, F. C., and Prime, F., Jr.: The Action of Radium on Transplanted Tumors of Animals.** *Ann. Surg.*, Phila., 1915, lxii, 751.

The opinions, based chiefly on clinical reports, of the therapeutic value of radium in the treatment of malignant growths have differed greatly. Whether the  $\beta$ - or the  $\gamma$ -rays are the most efficient in treating tumors, or whether both should be employed, are questions still undecided. For these and other reasons, the authors carried out a number of experiments in the Columbia University to determine the biologic action of radium, using animal tumors as an index of the lethal effect. Rat and mouse tumors of various types were used, among them the Ehrlich spindle-cell mouse sarcoma, and the Flexner-Jobling rat carcinoma. They were treated either after removal from the host or *in situ*, strict asepsis being observed. After exposure to the  $\beta$ - and  $\gamma$ -rays, portions of the treated tumor, as well as untreated fragments, were inoculated with animals of the same strain. A-rays were not used.

These results are claimed by the authors from their experiments:

1. Three factors only are important in the action of radium on tumors: time of exposure, amount of the radium element, and distance between the radium tube and the tumor tissue.

2. The removal of the  $\beta$ -rays diminishes the effect of the radium, but the effect of the  $\gamma$ -rays is in accordance with the same general law which governs the  $\beta$ -rays.

3. Sublethal exposures hinder the growth of tumor cells for some time, while still shorter treatments seem to stimulate the cellular activities.

4. The facts derived from the experiments regarding the quantity of radium element and the time of exposure necessary for a given distance may be applied, with reasonable accuracy, to human malignancies.



nant tumors. These experiments show that when only pure  $\gamma$ -rays are used the necessary exposure is eight times as long as that required when the  $\gamma$ - and hard  $\beta$ -rays combined are employed; but as the latter are largely absorbed by 1 cm. of tissue, the  $\gamma$ -rays alone must be used for all deep work.

5. The effect of radium radiations on tumor-cells *in vitro* is less marked than on isolated cellular elements. This explains the fact that an exposure which will destroy a small metastatic nodule in man is quite ineffective in the case of a well vascularized primary carcinoma.

HOLLIS E. POTTER.

**Quigley, D. T.: Therapeutic Effects of Radium.**  
*J.-Lancet*, 1915, xxxv, 653.

Quigley thinks that in ordinary cases of cancer, such as cancer of the breast, etc., the best plan is to operate when operation is possible and use radium as an after-treatment to kill out such cells as may be missed by the knife and thereby lessen the chances for recurrence. He believes the great future for radium is as a post-operative treatment. The question with relation to radium in cancer is not, Will radium supplant surgery in these cases? but, Will our surgical results be bettered by using radium in conjunction with surgery?

HOLLIS E. POTTER.

**McConnell, A. A.: A New Medium for Pyelography.**  
*Med. Press & Circ.*, 1916, ci, 238.

For some years collargol, a colloidal silver preparation, has been the medium most used for pyelography, and although other substances have been tried, as iodide of silver, none have proved so generally satisfactory.

Since the war, however, collargol has become most unprocurable, and McConnell in seeking a substitute in the English and American markets, failed to find anything but silver iodide, which, in his hands, did not give as satisfactory results. He therefore consulted Professor Caldwell of the Royal College of Surgeons, Ireland, asking him for a salt opaque to X-rays, harmless to the kidney, and capable of being injected through a ureteral catheter. Professor Caldwell was able to meet this request and supplied him with an entirely new bismuth compound to which the provisional name skirol is given. This is a non-irritating substance, has the consistency of milk, and is washed out of the renal pelvis by the urine before precipitation takes place. McConnell uses a 10 per cent solution, and has obtained better pictures than any he has obtained with collargol. It has not caused irritation in any of his patients. Moreover, he found that it disappeared from the pelvis more rapidly than collargol. Collargol has been found to remain in the renal pelvis from one to several weeks, while in some cases in which skirol was used, radiographs taken one or two days after the injection showed no shadow.

The technique is as follows: The patient is placed on the roentgen table, the ureteral catheter is

introduced up to the renal pelvis, the X-ray plate is adjusted, and preparations made to take a picture. The skirol solution is then allowed to flow into the ureteral catheter by gravity, from a container which is held not more than 12 inches above the level of the kidney, until the patient announces that some pain is felt in the kidney. At that instant the injection is stopped and the roentgenogram is taken. Then the fluid is allowed to run out and the catheter is removed.

DAVID C. STRAUS.

## MILITARY SURGERY

**Mott, F. W.: The Effects of High Explosives upon the Central Nervous System.** *Lancet*, Lond., 1916, cxc, 331.

The author describes three groups of cases in which the nervous system was injured by explosives: (1) immediate death from a missile; (2) injuries from high explosives which cause wounds, but are not fatal; (3) injuries of the central nervous system without visible injury. To the latter group must be added those cases which develop functional neuroses and psychoses.

The third group of cases is the one specially dealt with in this paper. Several theories are elaborated as to the possible causation of these intangible injuries to the nervous system: (1) Increased pressure in the cerebrospinal fluid may be the causative factor in these injuries. (2) Nerve-cells in a state of exhaustion are much more susceptible to shock than nerve-cells in the normal state. This fact may account for sudden death from the explosion of a shell without physical injury. (3) The sudden change in atmospheric pressure brought about by the explosion of a shell may result in the freeing of gas bubbles in the nervous tissues causing a similar condition to that found in caisson disease.

These theories are merely advanced by the author in a preliminary way and the discussion is to be continued.

J. H. SKILES.

**Vincent, B., and Greenough, R. B.: Gunshot Wounds of the Soft Parts.** *Boston M. & S. J.*, 1916, clxxiv, 153.

Vincent and Greenough at the American Ambulance, at Neuilly-sur-Seine, report 318 cases of injuries of soft parts by missiles such as shrapnel balls, rifle bullets, or shell fragments. The wounds were of every kind: lacerated penetrating, perforating, or wide surface abrasions. When received at the American Ambulance a majority of the cases were from twenty-four to seventy-two hours old and were with few exceptions septic. On entering the hospital the patient was given a general anæsthetic. The operation was devoted primarily to cleaning the wound and making free drainage. The wounds were enlarged as much as the extent of the infection required. The crushed edges of the wound and all the necrotic tissue were excised. All foreign material was removed. While no par-



ticular search was made at this time for missiles, for fear of spreading the infection to uncontaminated tissues, they were often discovered and removed. Pieces of clothing were often found just beyond or wrapped around the missile. When pieces remained in the tissues the course of sepsis was always prolonged. The use of rubber tissue for wicks and as a protective covering for raw surfaces prevented the gauze dressings from adhering to the wounds and saved the patients much suffering. Some of the most septic wounds were given continuous irrigations of sodium-hypochlorite solution, others had wet dressings that were frequently changed. Secondary sutures were done with good results in cases with extensive granulating surfaces.

The means of localization most frequently employed were the fluoroscope, X-ray plates, and the Bergonier electromagnet. The magnet was operated with an alternating current in such a way that the shell fragment was put into rapid vibration. By placing a hand on the skin between the magnet and the foreign body the place of maximum vibration was noted and an incision made at that point. The method could be applied to missiles in the soft parts only and not too distant from the skin. The extraction of a missile was often facilitated by the use of an ordinary electromagnet. A metal probe with its outer end resting against the magnet was inserted into the wound till it touched the piece of metal. The magnetized probe would in turn attract the missile which was withdrawn with the probe from the wound. This method was employed successfully by Cushing in removing fragments of shell from the brain and by Blake on a piece of shell buried deep in the pleural cavity.

For routine work the fluoroscope proved the most rapid, accurate, and economical means of localizing lodged missiles.

In certain cases where the fragments were small and numerous or because of an absence of symptoms, the missiles were left *in situ*. A. H. HIXSON.

**Weinberg, M.: Bacteriological and Experimental Research on Gas Gangrene.** *Lancet*, Lond., 1916, cxc, 622.

The work reported was first undertaken in the British Hospital at Versailles, September, 1914, during the battle of the Marne, and was conducted later in a number of hospitals, both French and British. The majority of surgeons seemed to have a confused idea of the nature of gas gangrene at the beginning of the war, and the tendency seemed to be to diagnose the condition every time a bad wound became infiltrated rapidly with gas. Two forms of gas gangrene are described: (1) the classic and (2) the toxic form.

In describing the classic form the author gives the details of a case as follows: A soldier was admitted to the hospital twenty-four hours after being wounded. The foot and two-thirds of the leg were very much discolored; the discharge emitted a putrid odor. The leg and thigh were swollen as

far as the junction of the middle and upper third; the veins were distended; the skin bronzed; and there was crepitation on palpation around the wound. The temperature was 102.5° F. A few hours later crepitation extended over the entire leg and thigh, and large blebs containing dark fluid were scattered here and there on the surface. The temperature rose to 104° F. Amputation was done in the middle of the thigh; the gangrene spread to the body and neck, and death occurred at the end of the second day. Dyspnoea was marked two hours before the end.

The development of some cases of this classical form was not always as rapid as in the foregoing case, because the microbe chiefly answerable was of a low degree of pathogenicity, and in such mild cases radical surgery often saved the patient.

The toxic form is characterized by extensive oedema, sufficient in some cases to mask the gas infiltration. This form is illustrated by the following case: A patient was admitted to a French hospital forty hours after he was wounded, having been exposed twenty-four hours between the French and German lines after the receipt of the injury. There was a wound in the middle third of the forearm. Gas crepitation around the wound was slight but extensive oedema was present up to the middle of the arm and the veins were prominent. In spite of free incisions and irrigation with oxygen peroxide, the oedema extended to the shoulder and chest and death occurred twenty-four hours later without the appearance of much crepitation. There was a putrid odor which was not necessarily a symptom of the case and it bore no relation to its gravity, since it might have been due to organisms of a low pathogenesis which were present.

The author exhibited some microphotographs of culture fields from cases which showed a variety of organisms, including bacilli perfringens, staphylococci, streptococci, and diplococci; also bacillus sporogenes.

It seemed that gas gangrene was not due to any one specific micro-organism. There is great difficulty in distinguishing bacillus perfringens from *vibrio septique* (malignant oedema), and the toxins must be tested with antitoxic serum. Bacillus perfringens produces a large quantity of gas while *vibrio septique* produces less. A bacillus oedematis had also been found in some cases, the toxins from which, when injected subcutaneously in guinea pigs, produced a rapidly extending oedema. This microbe was frequently associated with bacilli sporogenes. Weinberg emphasizes his belief that there is no flora peculiar to gas gangrene. A new microbe, bacillus fallax, causing gas gangrene has lately been discovered, when and by whom is not stated. Some of the organisms found in the flora of gas gangrene emanate from the air, others are of intestinal origin. Attempts to make hæmocultures have not been successful and they were rarely positive in the septic form of the disease. The very rapid course of gas gangrene in men and animals is thought to be



due to individual susceptibility. Careful observation and experiment have shown that gangrene of a limb is not always the result of gas-producing organisms, but complete obliteration of the vessel may arise from non-gas-producing organisms. It is interesting to note that gangrene of a limb following stoppage of the blood supply affords favorable conditions for the growth of gas-producing microbes.

To prevent gas gangrene, wounds should be treated early and radically. The diminution in the number of cases occurring now, as compared to the earlier period of the war, is due to the well-developed transport facilities which enable the relief corps to remove the wounded from the fighting front to casualty hospitals in a few hours. The wounds should be opened as widely as possible at once. Large projectiles and particles of clothing having been removed, the wound should be irrigated with weak antiseptics and the irrigation should be often repeated. Good results are also obtained by the use of superheated air and intravenous injections of salvarsan. Injection of polyvalent serum, made from all the organisms concerned, was also considered helpful.

**Moynihan, B.: The Treatment of Gunshot Wounds.** *Brit. M. J.*, 1916, i, 333.

The treatment of gunshot wounds in the present war has become greatly complicated by several factors: (1) The wounded soldier usually lies for many hours or even days before he can be removed to the field hospital. (2) The modern high-velocity projectile causes explosive destruction of tissue resulting in a large, deep, ragged wound, which is always infected. (3) The battlefields have been so intensely cultivated that the ground contains many virulent organisms with which the bodies and clothing of the men are sure to become contaminated. (4) The hygiene of the soldier is necessarily very poor. In some instances clothing has been worn continuously for several months. This results in a filthy condition of the person, which, together with his general run down condition, naturally leads to contamination of the wound.

The treatment of a wound therefore usually has to do with the combating of infection. A wound which is treated early may be excised or treated with some strong antiseptic, but these early wounds are in the minority.

The treatment of an infected wound should be very thorough, the entire field being thoroughly cleansed and adequate drainage secured. Many antiseptic solutions have been tried, the one which has given the most satisfactory results being Dakin's solution. Dakin's solution is made from bleaching powder forming calcium hypochlorite. It is a very effective antiseptic and does not apparently injure the tissues. Continuous application of the fluid to the wound is secured by continuous irrigation or by keeping gauze wicks soaked by immersing the ends in a dish of the solution. Sufficient drainage should be insured.

No gauze dressings or impermeable material should be placed over the wound, as a close covering tends to dam up the secretion.

The hypotonic salt solution of Wright is highly recommended to induce lymph lavage. Morrison and Tullock have advised the use of a solution of magnesium sulphate in place of sodium chloride. Out-door treatment and plenty of fresh air often work wonders in hastening the recovery.

The use of vaccines is still a matter of controversy, but there are undoubtedly selected cases in which they do much good.

J. H. SKILES.

**Carrel, Dehelly, and Dumas: Secondary Closing of Wounds.** *Brit. M. J.*, 1916, i, 211.

The authors presented a paper at the Paris Academy of Medicine in January on the results of the early closing of war wounds that have been treated with the sodium hypochlorite solution prepared after the Dakin formula. They conclude that the secondary closure of wounds in from four to ten days is a general method of great value.

Free incision of wounds as done formerly for exploration, the removal of foreign matter, and the use of drainage act as a drawback, since they prolong the treatment and cause an undue amount of cicatrization. The latter fills the spaces between the muscles, aponeurosis, and skin, which ends in adhesions and contractions, thereby hindering function. To avoid this, treatment by the Dakin solution permits the surgeon to bring the anatomical surfaces of a wound together by layers in the secondary closing of the wound, just as he does in a primary operation. When brought together early, connective tissue has not had time to form unduly; it is reduced to a thin sheet which does not seriously interfere with muscular movements.

The authors open up all wounds primarily, enough to admit of careful exploration, cleansing, and hæmostasis. The hypochlorite solution is instilled constantly for several days by the technique already recommended by them in previous reports. As soon as the daily bacteriological examinations indicate the disappearance of bacteria the wound is closed, usually in four to ten days. In those wounds that remain uninfected the tissues are unaltered in the course of the antiseptic treatment, and the authors find that the wounds thus treated unite by first intention, as is observed in operative wounds. The tissues should always be brought into exact apposition with adhesive strips 2.5 to 5 cm. broad. If the skin becomes adherent to the subjacent structures and granulation tissue has filled the intervening space the skin is loosened from the edges of the wound, the granulations curetted, and the parts including the skin are then brought into apposition with sutures. This procedure hastens the rate of recovery, avoids stiffness and atrophic changes.

M. Quénu and M. Bazy believe that good surgical technique and irrigation are of more importance than the employment of sodium hypochlorite as an antiseptic.

L. A. LAGARDE.



**Bérard, L., and Lumière, A.: Some Elementary Rules Relative to the Treatment of Suppurating Wounds in War** (Quelques préceptes élémentaires relatifs au traitement des plaies de guerre suppurées). *Rev. de chir.*, 1916, xxxiv, 445.

The authors call attention to the difference in the condition of projectile wounds in the recent period of the European campaign, where the fighting was in the trenches, and that of the early period when the war was one of movement and projectile wounds were mostly uninfected.

The suggestions which the authors formulate in the care and treatment of suppurating wounds are: (1) the removal as quickly as possible of all foreign bodies; (2) the draining as early as possible of infected tracts, and the discharging of purulent collections by large incisions and very large drains; (3) the treating of all wounds antiseptically, using hypochlorites preferably, especially the mixture of chloride of lime and boric acid; (4) the frequent changing of dressings and preventing the adhesion of pieces of the dressings to the wounds; (5) never to uselessly injure wounds; (6) to use humid dressings only occasionally in particular cases, renewing them quite frequently.

A. Goss.

**Dalton, F. J. A.: Sodium Hypochlorite in the Treatment of Septic Wounds.** *Brit. M. J.*, 1916, i, 126.

Dalton on the British hospital ship *Rewa*, investigating the value of sodium hypochlorite in the treatment of septic wounds, reports a series of 57 cases. The results obtained were uniformly excellent and there was an absolute unanimity among the members of the medical staff in the hospital ship in the preference for hypochlorite solution in the irrigation of infected wounds. Wounds were enlarged, counteropenings made, bone fragments and foreign bodies removed, etc., and thorough irrigation instituted with large quantities of hypochlorite solution. Rubber tubes were then inserted, and gauze strips packed into all parts of the wound. The ends of the rubber tubes were brought out through the dressings that the hypochlorite solution might subsequently be renewed by means of a syringe. Fresh hypochlorite solution was applied in this way every two hours in the severe cases. In the worst cases the gauze strips were removed after twenty-four hours, in slight wounds they were left in three or four days, the wounds cleaning up with simply spraying fresh solution into the tubes.

Dalton points out the following advantages observed in the employment of the sodium hypochlorite solution when properly prepared according to the Dakin formula: (1) The simplicity and cheapness of preparation of the antiseptic. (2) Being non-toxic and non-irritating to the tissues it may be used without ill effects in large quantities over long periods of time. (3) The deodorant action of the solution is remarkable. (4) The rapidity with which sloughs separate and clean granulation tissue is formed. (5) The infrequency of dressing required. (6) The

fact that injections of the hypochlorite solution into the rubber tubes used in the dressings may with safety be entrusted to very imperfectly trained orderlies without fear of ill results, once the case has been adequately dealt with by the surgeon.

A. H. HIXSON.

**Health of Armies in Peace and War.** *Lancet*, Lond., 1916, cxc, 517.

The annual report of the Surgeon General, U. S. A., for 1914 gives us a valuable means of comparing the health of an army during peace with that of the armies at war in Europe. Although the army is small in comparison with the armies engaged in the gigantic struggle abroad, it is sufficiently large to give valuable data.

Of the 88,000 men, 41 died of tuberculosis, 15 each from pneumonia and chronic heart disease, 10 from cancer—ratios which correspond with those of other armies during years of peace. The influence of vaccination against smallpox and typhoid fever is well shown. Among the 88,000 men there were 7 cases of smallpox, with one death, and 3 cases of typhoid fever, with no death.

The principal causes of admission to sick report were alcoholism and venereal disease, although these are showing a marked diminution in the last decade.

The Paris correspondent of the *Lancet* in a recent letter writes on the sick-rate of the French army at the front and shows that the more serious infectious diseases of civil life, such as scarlet fever and diphtheria, as well as mumps and less important ailments, are not so prevalent in the French army as during peace. Typhoid has been more frequent, but less fatal. No reference is made to the various special ailments of the present war—shell shock, soldier's heart, trench foot—and they may be intentionally omitted. The inference seems to be justified that the health of the French army has not been adversely influenced by the act of campaigning. Doctor Mosse of Berlin, author of a well-known work on disease and social position, has recently pointed out that diabetes mellitus and acute nephritis, often of the hæmorrhagic form, are more frequent in the youthful combatants. The health of armies in peace and war has been conserved by the rules of sanitary science in all civilized countries. The devastations incident to cholera, cerebrospinal meningitis, typhus, typhoid, yellow fever, and malaria are now practically unknown. The sanitary service of the military establishments today is rendered efficient by drilling the medical personnel in the duties of health officers. It is easier and less expensive to prevent disease than to treat it or to arrest its spread. In this regard the Sanitary Service of the British Army has accomplished a great deal in the present war. Every division of the army has a sanitary section consisting of 26 men (not including army service corps men); viz., one officer and 25 non-commissioned officers and men. The officer is generally a medical officer of health



or one who holds a diploma in public health service or as a bacteriologist; some are sanitary engineers and even architects.

A large number of the non-commissioned officers are sanitary inspectors, some hold sanitary diplomas, others are plumbers, carpenters, schoolmasters, graduates in honors from Oxford, Cambridge, and other universities, solicitors, chemists, and representatives of all professions and trades. In this varied personnel it is not difficult to provide each section with a sufficient number of disinfectors, interpreters, carpenters, cooks, builders for the special and varied services in the field. The work performed by these sections includes the bathing of troops by thousands; disinfection of the men for vermin, after enteric, cerebrospinal fever and other infectious diseases. Their further duties embrace disinfection of all clothing and blankets; purification of water; the drainage of farms and billets; giving instruction for the erection of destructors or incinerators, ablution tanks, grease traps, urine pits, filters, fly-traps, and the installation of every kind of structure or appliance that appertains to sanitation in the field.

After great battles, when the casualties are so great in numbers that the ambulances cannot deal with them, the personnel of the sanitary companies is called upon to assist in the care of the injured. This body of expert workers has rendered the Royal Army Medical Corps officers valuable assistance in many ways, especially in watching over the health and sanitation of the soldiers.

Aside from the work of the medical corps and sanitary sections in warding off disease, great assistance has been derived from auxiliary bodies like the Red Cross. Through its assistance the mortality among the wounded has been very much reduced since its organization by Henri Dunant a half century ago.

L. A. LA GARDE.

### SURGICAL PATHOLOGY

**Razetti, L.: Operative Mortality** (La mortalidad operatoria). *Gac. med. de Caracas*, 1916, xxiii, 17.

The author reports the results of 310 operations performed during a period of 22 months. The cases were divided into the following groups: head, neck, thorax, abdomen, genito-urinary apparatus, perineum and rectum, extremities.

Of 310 patients operated upon, 30 died, a mortality of 6.67 per cent. The general mortality in the surgical clinic was divided into two classes: the pathological mortality and the operator mortality, or those due to accidents or complications derived directly from the operation itself.

Of the 30 deaths, 16 were pathologic and 14 operator, or a pathologic mortality of 5.16 per cent and an operator mortality of 4.51 per cent.

The cases occurred in a general hospital; the cases were not selected, and some of the cases were in an advanced stage or their general condition on admission was very unsatisfactory.

RAOUL L. VIORAN.

**Apert, E.: Urticaria and Pseudo-Appendicitis.** *Monde méd.*, 1916, xxvi, 65.

The acute forms of urticaria and sometimes also the chronic, may give rise to an actual pseudo-peritoneal syndrome, akin to that of purpura and polymorphous erythema, possibly simulating appendicitis. Our present knowledge of the pathogenesis of urticaria enables us to understand what happens in such cases.

Since the works of Richet, Artus, Lesné, Widai, and Joltrain, it has been known that urticaria is an anaphylactic phenomenon and that the cutaneous troubles are only the outward and visible manifestations of sudden changes in the blood, of what Widai calls a "hæmoclastic crisis," of a splitting up of the blood. The pseudoperitoneal phenomena testify to the existence of this state. The absence of the local signs of acute appendicitis, the absence of rigidity of the abdominal wall and of localized skin hyperesthesia, should prevent any confusion between an attack of appendicitis and the pseudo-peritoneal attack associated with urticaria.

W. A. BRENNAN.

**Gaucher: Unrecognized Syphilitic Lesions Surgically Operated as Cancers or as Local Tuberculosis** (Des lésions syphilitiques méconnues opérées chirurgicalement comme cancers ou comme tuberculoses locales). *Ann. d. mal. vén.*, Par., 1916, xi, 153.

Theoretically the differences between syphilitic, tuberculous, and cancerous lesions appear to be so well established that in practice there should hardly be an error. Nevertheless the diagnosis is sometimes very difficult, or at least it is very inexactly made in a number of cases by surgeons who are experienced and well-informed. Errors are oftenest observed in chancres, gummatous infiltrations, and in osseous and articular lesions.

The confusion of syphilis with local tuberculosis has very grave consequences, particularly when it is a question of osseous or articular lesions. The author has frequently directed attention to the similarity of the suppurative osteitis and the osteo-arthritis of hereditary tertiary syphilis and tuberculous osteitis and arthropathies. Suppuration is not and cannot be admitted to be a distinct characteristic of tuberculosis. Hereditary osseous syphilis can be suppurative as well as osseous tuberculosis.

Not alone in the matter of hereditary syphilis are errors made, but also in the white tumors in adults, which result from acquired syphilis and which are frequently treated as white tuberculous tumors and operated as such.

The author mentions several cases which have come under his notice which corroborate his contentions. He therefore thinks that in all osseous or articular lesions which are apparently of tuberculous origin the Wassermann reaction should be looked for and mercurial treatment tried before surgery is resorted to.

W. A. BRENNAN.

### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

#### The Duties of Medical Practitioners in Cases of Criminal Abortion. *Brit. M. J.*, 1916, 1, 206.

The duties of medical practitioners in cases of criminal abortions are discussed in the original article. The question as to how far a medical man, who obtains in his professional capacity knowledge of the commission of a criminal offence, is in duty bound as a citizen to give information to the police authorities and so set the criminal law in action, is one which should be of great interest to the medical profession.

Probably the most frequent occurrence in which an opportunity of this kind might arise, is that of a medical man called in to attend a woman upon whom an illegal operation has been performed; and in such a case under the decisions of the English Court cited in the article, it is safe to say that the doctor is under no obligation to, and indeed should not, divulge the information which he has obtained in his professional capacity; as it is of the highest importance that professional confidence should be respected and held inviolate. Quoting from an English case: "I doubt very much whether a doctor called in to assist a woman in procuring an abortion, for that in itself is a crime, but for the purpose of attending her and giving her medical advice could be justified in reporting the facts to the public prosecutor. There might be cases when it is the obvious duty of a medical man to speak out and it would be a monstrous thing for a medical man to screen a person going to him with a wound which it might be supposed had been afflicted in the course of a deadly struggle." The above is a quotation of Lord Brampton's remarks before the Royal College of Physicians of London in 1896.

In 1914 the English Courts had to deal with a case of an alleged illegal operation on a woman on whom three successive doctors had been in attendance. None of these doctors had given information to the police, and there was consequently no evidence upon which to convict the prisoner who was

charged with having performed the illegal operation. The court in discussing the failure of the attending physician to report the matter stated: "No one would wish to see disturbed the confidential relation which exists between the medical man and his patient, but there are cases, and it appears to me that this is one, where the desire to preserve that confidence must be subordinated to the duty which is cast upon every good citizen to assist in the investigation of a serious crime such as is here imputed to this woman. It may be the moral duty of the medical man, even in cases where the patient is not dying, or not likely to recover, to communicate with the authorities when he sees good reason to believe that a criminal offence has been committed."

The trend of the above decision will be noted to be somewhat contrary to the one previously cited, and holds that medical men are under the same moral duty as other citizens in all cases where they become aware of the commission of a crime, to report it to the authorities. The above two different opinions, when brought to the attention of the British Medical Association, caused it to appoint a committee to confer with the Lord Chief Justice upon this important question. This deputation was received by the Lord Chief Justice on May 3, 1915, and the summary of the resolutions passed by the Royal College of Physicians of London, as a consequence of said interview, is as follows: That a medical practitioner is not justified in disclosing information obtained in the course of professional attendance upon a woman without her consent, but that when he is convinced that a criminal abortion has been performed on his patient he should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced; and that in the event of her refusal to make such a statement he is under no legal obligation to take further action; that in the event of the patient dying he should refuse to give a certificate of the cause of death and should communicate with the coroner.

JOHN A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Goodwin, R. T.: Lacerated Cervix.** *Texas St. J. Med.*, 1916, xi, 542.

The author reviews the anatomy of the cervix, gives the most frequent symptoms of lacerations of the cervix, the results produced thereby, and concludes by discussing the operative treatment.

Lacerations of the cervix are very common. The chief cause of cervical tears is meddling obstetrics; for example, want of care or judgment in the use of forceps, premature rupture of the bag of waters, the injudicious use of the drugs, ergot and pituitrin, mechanical dilatation of the cervix, and roughness in performing podalic version.

The symptoms are not pathognomonic and are due to the lesions caused by the laceration. The most constant of these secondary conditions are, subinvolution of the uterus, endometritis and uterine displacements; and the symptoms usually described as being due to lacerations of the cervix are in reality caused by one or all of these complications. Backache, bearing down in the pelvis, vertical headache, leucorrhœa, menorrhagia, metrorrhagia, sterility and abortion, are the most frequent of these symptoms.

The results of the lacerations are either immediate or remote. Of the immediate results the most frequently observed are hæmorrhage, sepsis, and vesicovaginal fistula. The principal remote results are subinvolution of the uterus, chronic endometritis, uterine displacements, due to subinvolution or to contractions of cicatricial tissue in the cellular structures behind the uterus; chronic tubal and ovarian disease, and cancer.

As a large number of lacerations require no treatment whatever, it is important to have a clear and definite idea as to what class of cases require operative interference.

The following rules have been formulated for this purpose:

1. Operate upon all lacerations which are complicated with induration and hypertrophy of the cervical tissues, eversion of the intracervical mucous membrane, cystic degeneration, and erosion.

2. Operate upon all lacerations which are responsible for subinvolution of the uterus, endometritis, and uterine displacements.

3. Operate upon all lacerations which are associated with a sensitive plug of scar tissue in the angle of the wound.

Any grave pelvic disease is a contra-indication for operative interference in laceration of the cervix. There is always considerable dragging upon the uterus during an operation upon the cervix, and

these manipulations may cause a fatal peritonitis by breaking up old adhesions. RALPH H. KUHN.

**Percy, J. F.: The Problem of Heat as a Method of Treatment in Inoperable Uterine Carcinoma.** *Tr. Am. Gynec. Soc.*, Washington, 1916, May.

There are three stages to be recognized in the development of cautery treatment of carcinoma of the uterus: (1) that in which it is used merely to stop hæmorrhage and limit offensive discharge. (2) in the galvanocautery excision of the cervix uteri, developed by the late Dr. John Byrne of Brooklyn. (In this technique a degree of heat sufficient to cut the tissues was used); (3) in the dissemination of a coagulating degree of heat through the widest area possible of the cancer mass, with no attempt at immediate excision of the parts (Percy).

The technique of Byrne was not designed for advanced inoperable cancer in which the uterocervical junction is fixed, with extensive malignant and inflammatory infiltration of both broad ligaments and the perimetrium. As classified today, Byrne operated only in the first steps of cervical cancer involvement. He deplored the use of the cold steel knife in cervical cancer and forty-four years ago referred to it as "a comparatively fruitless procedure at best." This is just as true today — without the preliminary use of heat — as it was in his day. The cases treated by Byrne with galvanocautery excision of the cervix were the type of cases which would be considered suitable for the Reis-Wertheim treatment of today.

The author has the following to say as to the future of the heat treatment: "The stage of operability with my present technique is easily 90 per cent, and I confidently expect that, if the promise which I see in my work is realized in the further development of the use of heat in cancer, the stage of operability will be without limit in strictly pelvic cancer. I would not have you believe, however, that the ideal is mere operability. Back of it all is the hope and promise of results never before obtained by any method so far developed in that disease which has always stood as a synonym for incurableness, pelvic cancer. In conclusion permit me to re-emphasize the following points:

1. "The Percy technique, so-called, is not a cautery operation. I remove nothing. The tissues, following the application of moderately low degrees of heat, are literally coagulated and slowly dissolve. It usually takes two weeks for a healthy granulating surface to appear beneath the gradually dissolving mass of inert cancer debris.

2. "The operation of Byrne was a high galvano-cautery incision of the cervix. There could be but little penetration of heat. Byrne recognized this when he advised that the surface left after the removal of the gross mass be seared over with the cautery knife in order to get all the heat penetration possible. But Byrne never thought of applying heat to the degree of obtaining penetration sufficient to render movable the fixed tissues in the pelvic basin. If the fixed tissues, malignant and inflammatory, are not made freely movable, as they are normally, the heat penetration has not been sufficient, and, therefore, is ineffective.

3. "To coagulate a large mass of uterine cancer requires from thirty to sixty minutes, and if the broad ligaments still remain stiff, or fixed, an additional ten minutes.

4. "In my effort to emphasize the importance of avoiding the burning temperatures, I fear that I have led many surgeons to the opposite extreme, and that they are trying to destroy the activity of an inoperable mass of cancer with a temperature so low that days, rather than hours, would be required to make the heat effective. Byrne fried his tissues. I broil, or pasteurize, them. The Byrne technique was based on the use of heat as an acute process. Mine is not acute, but chronic, both as to time and degree. Heat, more heat, and yet more heat; but heat, not fire; broiling, not frying; not roasting, but curdling; pasteurization, not desiccation; coagulation, not carbonization.

"In its practical application, the whole technique can be summed up in the one statement: Do not carbonize the tissues. For in the degree that this is done, in that degree is heat penetration inhibited; and heat penetration is the vitally essential thing. A gentle simmering sound only should be heard when the ear is placed near the vaginal water-cooled speculum. This simmering sound is produced by a temperature above 45° C. (113 F.). It probably ranges from 83 to 93° C. (180 to 200° F.). Heat in the cancer, operable or inoperable, or as a preliminary to the use of the cold steel knife, has, with its present development, come to stay. It offers more in the way of cure in the early case than any other treatment so far devised. In the late case it promises surcease from suffering, with a prolongation of life that is most hopeful.

"But more than all else, we have not yet fully learned the technique of most effectively destroying cancer in the accessible regions of the body by heat. When we do, another chapter will have been written in the history of man's contest with his physical ills that will compare very favorably with anything so far accomplished along the lines of scientific endeavor."

**Ransohoff, J. and J. L.: Radium Treatment of Uterine Fibroids.** *Lancet-Clin.*, 1916, cxv, 116.

The authors believe that radium is the method of choice in the treatment of uncomplicated uterine fibroids, as the treatment is safe and in the usual

case the symptomatic cure almost certain. It should not be used where there is a reasonable doubt in the diagnosis, or where the fibroid is complicated by infections of the tubes and ovaries.

Operation should also be the method of choice where pressure symptoms are so acute as to demand immediate relief.

Radium treatment is superior to X-ray treatment, because the radium can be brought into intimate contact with the fibroid itself and does not depend on its action on the ovaries.

Four typical cases are cited. One particularly interesting case was that of a fibroid in a woman past the menopause, occupying the entire pelvis and extending two inches above the umbilicus. Under radium treatment a complete disappearance of the tumor was secured. Operation in this case would have been unfavorable, because of the presence of a large aneurism of the arch of the aorta.

**Condit, W. H.: Compensatory (Vicarious, Ectopic) Menstruation; Xenomenia; Memmes Devii.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 238.

The author reports the interesting case of a young woman who had a hysterectomy and bilateral salpingo-oophorectomy, yet each month had the subjective symptoms and sensations which had characterized her previous normal menstrual periods and had a hæmorrhage into some of her cutaneous tissues. Fifteen days after the operation at the regular menstrual time she had a hæmorrhage into a nævus the size of a split pea situated over the left ninth intercostal space. It attained the size of a hen's egg and there occurred a considerable ecchymosis in the skin about the nævus. In four days the tumor diminished in size one-half and soon the skin ecchymosis disappeared. No blood escaped from the tumor or skin. This process was repeated regularly every twenty-eight to thirty-four days for twenty-one months until the tumor mass which had gradually formed ruptured and she at last consented to operation. Microscopic sections were negative for melanosis.

At the next regular period the left mammary gland was attacked in a similar manner but after one year the manifestations in this gland became less frequent and regular, and at the end of two years it had returned to practically its normal appearance. The author now hoped that relief had come, but she then had an extensive subcutaneous hæmorrhage into the extensor surface of both legs, accompanied by pain and extreme ecchymosis from the thighs to the knees; similar attacks occurred in one leg thirty-four days later and were repeated each month. The last attack occurred in July, 1914, seven years and three months after the operation. It involved the posterior surface of her right leg from the gluteal fold to the ankle, being most marked over the popliteal space.

The conclusion arrived at in this study is that menstrual abnormalities or irregularities are due to blood-pressure changes in the individual, together



with some atrophic or pathological changes in part or parts where the hæmorrhage manifests itself. In the particular case reported, the peculiar demonstrations were brought about by a failure of the individual physical economy to adapt or adjust itself to the change brought about in the blood-pressure by removal of part or parts previously acting as the safety valve of this particular economy.

C. H. DAVIS.

**Lange, S.: Recent Results in the X-Ray Treatment of Menorrhagia, Dysmenorrhœa, and Uterine Myoma.** *Am. J. Roentgenol.*, 1916, iii, 72.

Lange's paper is based upon 50 consecutive cases of menorrhagia, dysmenorrhœa, and uterine fibroids treated by X-ray therapy. In every case a satisfactory result was achieved, an artificial menopause, apparently permanent, occurring in every case in which it was desired, regardless of the age of the patient. These cases were referred from many different sources, and while only ordinary care and skill were employed in their selection, malignancy has not developed in any case either during or following the treatment. So far as he has been able to follow the case there has been no recurrence of the menstruation after it has once stopped. In several cases there has been an occasional faint menstruation during the few months just following the menopause. After a lapse of a few months, however, abatement of the ovarian function has been complete and permanent. He has found it to be a safe working rule that if one period is missed all treatment may be discontinued.

In this series of 50 cases, 19 were treated because of persistent menorrhagia. The ages of the patients varied from seventeen to fifty years. The minimum of X-radiation required to bring about a permanent menopause was one treatment (100 X) in a woman of forty-nine. The greatest amount given any patient was 800 X (eight treatments) which was required to abolish the ovarian function in a girl of twenty. Another patient of seventeen years of age required only 700 X to accomplish the same result. A woman of twenty-eight required 600 X (six treatments). A woman of thirty-two required 500 X. With increase in the age of the patients the amount of X-radiation required rapidly decreases.

The equipment consists of a Coolidge tube backing up a spark gap of nine to nine and one-half inches, and a filter consisting of 3 mm. of aluminum and a thick layer of sole leather. With a target skin distance of six inches 10 milliamperes are passed for 2.5 minutes (over 20X through each of four areas, or about 100 X for each treatment).

Within a month Lange would give three such treatments, but in a footnote concedes the possibility of an error in his Kienbock readings and that other operators would use an interval of three weeks between treatments. (A caution the unskilled operator would do well to consider carefully.)

DAVID R. BOWEN.

**Collins, A. S. A. W.: An Operation for Retrodisplacement of the Uterus.** *Am. J. Surg.*, 1916, xxx, 92.

The uterus is held in normal position; the round ligaments are caught with Kelly forceps and brought toward the median line; and about 1 inch of the peritoneum is peeled back from close to the tip of the forceps.

As the object of the operation is to maintain the uterus sufficiently anterior so that intra-abdominal pressure is exerted upon the posterior surface of the fundus, and also to overcome a prolapse of the ovaries, one of two methods must be decided upon. Either bring the ligament under the round and ovarian ligaments through an opening in the broad ligament posteriorly, as in Webster's operation, or anteriorly.

A stab with a knife is made under the peritoneum and about a sixteenth of an inch into the muscle of the uterus and brought out again. The knife should be narrow and the wound made just large enough to accommodate the round ligament. The same is done on the opposite side and the ligaments are then sutured in place. The operation is rapidly done. There are no raw surfaces and no bleeding.

1. It is a muscle-to-muscle attachment and no possibility of a pulling away to one side or another.

2. It is not a peritoneal attachment which forms an adhesion and will stretch or give way altogether.

3. There is no interference in pregnancy. (The author has had four patients who have gone through labor normally with the uterus in good position afterwards.)

4. No bladder or other subjective symptoms follow.

5. The uterus remains mobile.

EDWARD L. CORNELL.

**Handfield-Jones, M.: Clinical Aspect of the Double Uterus in Its Relation to Diagnosis and Treatment.** *Lancet*, Lond., 1916, cxc, 574.

The paper is based on the reports of 10 cases of this condition, 8 of which came under the author's observation. The cases were selected to illustrate certain clinical points. Among them were: (1) a case in which septic infection of the second unimpregnated uterus occurred after delivery of a child from the other uterus; (2) a case in which twin foetal sacs were removed from one uterus and the patient safely carried to term a single pregnancy in the second uterus; (3) a case of hæmatometra in a double uterus; (4) a case illustrating obstruction to delivery by the unimpregnated portion of a double uterus; (5) a case in which the unimpregnated uterus was safely drawn up out of the way of the pregnant portion, and delivery was unobstructed; (6) a case in which death occurred from sepsis and hæmorrhage following an attempt to divide the septum separating the two uteri, both of which were pregnant, after the first uterus had been safely emptied; (7) a case in which pregnancy proceeded to full term in one half of a double uterus after



the other uterus had been emptied by curettage in the early months; (8) a case in which a double vagina was discovered by the patient herself; and (9) a case in which pregnancy proceeded safely to term after the condition had been demonstrated by an exploratory laparotomy in the early months of pregnancy.

C. D. HAUCH.

**Gallant, A. E.: The Removal of the Troublesome Useless Uterus.** *N. Y. M. J.*, 1916, ciii, 485.

Eliminating hysterectomies for (1) life-destroying disease and (2) for conditions detrimental to health or dangerous to life, the author goes on to the consideration of (3) removal of the uterus because of conditions the source and cause of health-destroying discomfort; "troublesome" because they were the cause of intractable suffering; "useless" because they were either absolutely, relatively, or practically incapable of performing the one sole function of the uterus—reproduction. In 12 women, between 57 and 73 years, who had ceased to menstruate; the senile uteri were removed because of a prolapsed bladder with or without rectocele or descent of the uterus or intestines, in 7 cases; uterosacral ligament retrofixation, 4 cases; chronic pyometria and ovarian sarcoma (?), one case. The second group included 11 women, whose ages ranged from 37 to 47 years, and who were still menstruating. Four had passed the "approximate" age for the menopause, from 2 to 11 years; while the other 7 still had in prospect from one to five years longer to flow, normally. The average range of fertility was from one to seven children; the most recent birth seven months previous to operation; the average length of sterility was between six and seven years.

The third group included 7 suffering women between 30 and 34 years, in the full tide of reproductive activity, who had not been benefited by local and general treatment or by conservative operations.

Gallant, when deciding to operate or not to operate, was influenced, largely, by (1) the severity of the symptoms; (2) the effect on the general health; and (3) the environment. Excessive nervousness was the one predominating complaint in all but one instance. Dysmenorrhœa came next in order of frequency, usually of a severe type, lasting throughout the flow, and compelling the sufferer to lie down for a few hours or go to bed for one, two, or even three days of each period. Backache was a very common symptom, located by placing the hands over the sacral region, variously described as "come and go pain," dragging, tearing, bearing down, falling, and present all the time, during the monthlies, not so bad between, etc., but to each one very trying and very real. Headache, suboccipital, was present in over half the cases, and of a truly torturing variety, relieved only by some sort of "dope." Ilio-abdominal pain, when not of appendicular origin, was of a dragging, tearing, burning character, and referable

to tension on the round ligaments, or enlargement or adhesions of the tubes and ovaries, distinguishable from the appendix only by actual palpation. Dyspareunia was present whenever the vagina was raw or the uterosacral ligaments immobilized the uterus.

Dysuria, with frequent, painful urination, was nearly always associated with a demonstrable trigonitis, an acid vaginitis, and acid urine of high specific gravity.

The conditions calling for operation were prolapsed bladder, with or without prolapse of the uterus and rectum, 11 cases; retroversion, 17 cases; uterine fixation, 16 cases; hypertrophied uterus, 15 cases; antelexion, 4 cases; lacerated cervix, 6 cases; perineum, 11 cases; diseased ovaries and tubes, 6 cases; persistent vaginitis, 6 cases; with goiter, 3 cases; visceroptosis, 12 cases.

The operative measures were vaginal hysterectomy, 19 times, with salpingo-oophorectomy, 1 case; complete excision of vagina, 3 cases; partial excision, 4 cases; supravaginal, 4 cases; with ovaries and tubes, 1 case; abdominovaginal pain, 2 cases; abdominal pain, 2 cases; anterior colporrhaphy, 2 times; perineorrhaphy, 6 times; appendectomy, 4 times; uterine drainage, 2 times; drainage through the cervical stump, 2 times; conservative (?) amputation of cervix, 2 times; resection of sigmoid, 1 case. This last patient died on the fifth day after operation, presumably from rupture at the site of the resection brought about by her strenuous efforts to avoid soiling the bed. One other died, 28 days after complete closure of the vagina, from "hypostatic pneumonia."

In conclusion, Gallant states his belief that removal of a troublesome, useless uterus is not only justifiable but the most rational procedure in the following conditions:

1. In senile women, complete denudation and closure of the vaginal canal is the one sure and permanent means of curing hernia vaginæ.

2. In well-nourished women, who have ceased to menstruate, or who have passed or are approaching the "approximate age" when the menses should cease, hysterectomy and partial colectomy will prove beneficial and still provide for marital relations.

3. In menstruating women under thirty-five years, after every means to conserve childbearing function have been exhausted; when the conditions cause a life of semi-invalidism; when they prevent her from working and earning a livelihood; when they seriously interfere with her duties to her husband and children and condemn her to a life of unalloyed suffering, then and then only, as a last resort, should the uterus be removed.

4. Whenever the pelvic conditions are associated with a troublesome, colicky appendix, or simple or exophthalmic goiter they should be removed.

5. Whenever combined with visceroptosis a cure cannot be expected unless the patient is fitted with an appropriate corset.



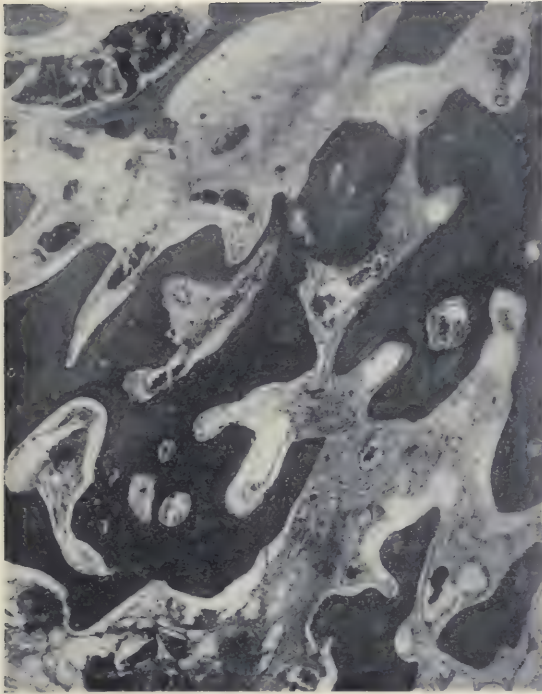


Fig. 1.

Fig. 1. Section from the interior of a bony nodule within the ovary, showing bone lamellæ, haversian canals, and bone-marrow. (Moschcowitz.)



Fig. 2.

Fig. 2. Low-power section taken near the periphery of the bony nodule. Space within the lime-containing

area filled with delicate fibrous tissue, fibroblasts, and young blood-vessels. Along the circumference of these spaces are fibroblasts which have penetrated into the surrounding lime-containing tissue, revealing a coincident lime absorption. (Moschcowitz.)

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Moschcowitz, E.: The Relation of Angiogenesis to Ossification, Based upon the Study of Five Cases of Calcification and Ossification of the Ovary.** *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 71.

Within a comparatively short time the author has been able to study in the pathological laboratory of the Beth Israel Hospital three cases of calcification and two of ossification of the ovary. The lesions were studied particularly from a morphological viewpoint. The process in each instance involved a corpus albicans. The specimens represented an apparently continuous series, in which four stages were recognizable: (1) an early discrete multiple deposit within a healed corpus luteum; (2) a definitely circumscribed deposit of amorphous lime within a corpus albicans; (3) the formation of primary haversian canals, which is accomplished by the genesis of an active mesoblastic tissue, both upon the surface and within the interior of such a circumscribed lime deposit (This mesoblastic tissue is derived from the adjacent blood-vessels of the ovary, and the predominant activity is the development of new blood-vessels; associated with this

activity is the development of osteoblasts from the mesenchymal cells.); (4) true bone formation, with maturation of all the elements described above, together with eccentric deposition of bone-plates around the primary haversian canals and the formation of marrow.

Moschcowitz states that the development of new blood-vessels affords the keynote to the interpretation, in terms of cellular ontogeny, of the process of ossification, and that the histological constituents which enter into the formation of new blood-vessels are the progenitors of all the histological components of osseous tissue. In other words, that blood-vessels, osteoblasts, bone-cells, and marrow (in part at least) are merely differentiations of the mesenchymal cell unit.

To his mind, the author's specimens furnish strong corroboration of the "adaptive" or "mesenchymal" theory of angiogenesis, and to the theory of the non-specificity of endothelium. Ossification, he believes, does not occur without preliminary calcification, and calcification occurs only in dead tissues, and there is no valid reason for regarding bony structures within the ovary as blastomata.

GEORGE E. BEILBY.



**O'Shansky, A. L.: Infection of Ovarian Dermoid Cyst with Typhoid Bacillus.** *J. Am. M. Ass.*, 1916, lvi, 888.

Two months after an attack of typhoid fever, a school-teacher, aged 21, noticed a mass in the abdomen. One month later she was operated upon. A large ovarian cyst on the left side was aspirated and about two quarts of thin pus removed. A few strands of hair were attached to the cannula on removal. The tumor was ligated at its pedicle and removed.

On bacteriologic examination, a smear showed a gram-negative bacillus. The growth showed a gram-negative motile bacillus in pure culture which did not produce gas in sugar mediums, did not liquefy gelatin, and did not coagulate milk.

Pathologic examination of the cyst in gross after fixation revealed a growth 15 by 15 by 11 cm. in its largest diameters. The fallopian tube was attached on one side. When the cyst was opened, a quantity of grayish liquid, containing a fatlike substance, such as is commonly found in dermoid cysts, came out and masses of this fatty material containing hairs were removed. At one portion, where the wall was thickest, there was a tuft of hair growing from the wall. At another portion there was a short nipple-like projection somewhat calcified. Microscopic examination revealed an infected ovarian cyst.

The patient made an uneventful recovery and has had no further complications.

EDWARD L. CORNELL.

**Abelio, G.: Strangulated Fallopian Tube, Ovary, and Intestine in an Infant.** *J. Am. M. Ass.*, 1916, lvi, 813.

The patient was a girl, aged 11 months, breast-fed, and with no febrile or diarrheal disturbances of any sort. Three months previous to operation she developed a mass in the right inguinal region, the appearance of which was associated with apparently severe abdominal pain and vomiting. Prior to this no such mass had been noticed by the parents. Taxis was successful in three attacks. Two months later a mass appeared in the right inguinal region; the baby began to cry as if in severe pain; vomiting set in. Unsuccessful attempts at reduction had already been made. She had had no bowel movement for about 48 hours. Examination revealed a somewhat distended abdomen, not by any means tense, and a right inguinal mass, about 5 cm. in diameter and elevated above the normal skin level to the extent of about 2 cm. This mass was exquisitely tender and very tense. Immediate operation was advised and performed.

An oblique incision above the mass displayed a well-formed, spherical, tense, dark-colored peritoneal sac bulging directly forward through the external ring. The contents consisted of a large almond-sized mass, readily recognized as the ovary, to the postero-external aspect of which was attached a tiny fallopian tube. Posterior to both was a knuckle

of dark-colored small intestine. Very slight traction on the intestine was made, a Kocher director inserted between it and the neck of the sac and the latter nicked enough to enable reduction to be made of the herniated viscera. Several minutes after the release of the constricting neck, the ovary had reduced about 100 per cent in size and the intestine became a very deep red. The opening in the peritoneum was closed, muscle and fascia approximated to Poupart's ligament and the lower leaf of the external oblique imbricated over this line of sutures. The skin was closed with silkworm gut and the whole covered with a gutta-percha collodion dressing. Three hours after the operation a copious, very foul smelling bowel movement resulted. The convalescence was uneventful. EDWARD L. CORNELL.

**Moore, J. E.: Salpingitis Secondary to Appendicitis.** *Surg., Gynec. & Obst.*, 1916, xxii, 277.

The small entrance into the tubes from the uterine side would seem to be one of nature's provisions to prevent bacteria from entering the peritoneal cavity through the natural channels. The fimbriated extremity of the tube is wide open, and if any bacteria are present in the peritoneal side they can easily gain entrance to the tube. Under normal conditions the tubes are further protected on the uterine side by a sterile uterus and only become infected under abnormal conditions of the uterus.

It is rational to conclude that when abnormal conditions obtain within the peritoneum the tubes may be infected from the peritoneal end. It is well established that the majority of cases of salpingitis are due to a gonococcus infection, but there are many due to other bacteria. Cases are cited to prove that appendicitis is not an uncommon cause of salpingitis. The author believes that it should be accepted as an established fact that a certain small percentage of cases of salpingitis are due to appendicitis, so that when looking for possible causes of the pelvic inflammation this fact may be taken into consideration.

#### EXTERNAL GENITALIA

**Gellhorn, G., and Ehrenfest, H.: Syphilis of the Internal Genital Organs in the Female.** *Tr. Am. Gynec. Soc.*, Washington, 1916, May.

At present it is impossible to estimate even approximately the full extent to which syphilis exists in the world. The latest statistics which tend to show that 10 per cent of the male population of the United States are affected are probably far too conservative.

Syphilis has always been assumed to be considerably commoner among men than among women, but from certain investigations this supposition cannot yet be accepted as conclusive. At any rate syphilis is common enough in women to constitute a gynecologic problem in the widest sense. Not every disease in a syphilitic woman is syphilitic in nature,



but syphilis if present will exert an influence of its own upon coexistent diseases. Moreover, latent syphilis prevails more in women than in men.

The course of syphilis in men differs in many points from that in women. To cite but one of the differences, the relative frequency of tabes and paresis in the two sexes is well known.

Syphilis of the internal genitals in women presents a number of problems as yet unsolved. The question of infection by the sperma of a syphilitic man is discussed; also the possibility of differences in the strains of *spirochætæ* which might have a predilection for one part or the other of the female genital tract. There is, finally, the question whether certain parts of the genitalia possess a sort of relative immunity.

Primary chancres of the vagina are rare, probably because of certain histologic and biologic characteristics of the vagina. The typical signs of sclerosis of a mucous membrane; i.e., parchment-like induration, persist as a rule only for a short time. Under ordinary circumstances, spontaneous restitution occurs after about two weeks. The absence of definite symptoms, such as pain or vaginal discharge, and the insignificance of any remaining scars probably result in many cases in failure or even inability to correctly diagnose this lesion.

Secondary syphilitic lesions of the vagina are very rare. They occur either in the form of macules or papules; the latter variety seems to be relatively more frequent. They have no symptomatology of their own, and therefore are discovered only accidentally during an examination with the speculum.

Tertiary luetic manifestations of the vagina are also extremely rare. They represent as a rule the continuation of secondary lesions in the vulva, uterus, or adjoining organs. The isolated submucous gumma breaks down early and appears in the form of a more or less characteristic ulcer. The more destructive processes which eventually lead to the formation of fistulæ and strictures, almost always originate in structures surrounding the vagina. Tertiary lesions of the vagina do not exhibit characteristic symptoms such as pain or discharge.

Primary chancre of the cervix represents the best known and most common type of syphilitic affections of the female internal genitalia. Its frequency has probably been overestimated. Statistics based on a large number of observations have never shown a frequency of over 1.5 per cent of all primary chancres found on the genitalia. It must, however, be admitted that in a considerable number of cases its presence on the vaginal portion of the cervix is overlooked.

Primary chancre of the cervix does not give rise to any noteworthy clinical symptoms. Therefore, as a rule a search for it is made only after the appearance of the secondary exanthema. Under normal conditions the primary lesion heals with such rapidity that its existence in a large percentage of

cases can only be surmised from certain findings which in themselves are not characteristic.

Not even during its existence does the primary chancre offer a truly characteristic and pathognostic aspect on account of its rapid and variegated evolution from an uneroded induration to an ulcer which in turn either heals quickly or transforms into an inconspicuous erosion.

Considering the absence of palpable satellite buboes and the difficulty of ascertaining the characteristic induration of its base, a suspicious looking sore on the cervix can be identified as primary hard chancre only if the *spirochætæ pallida* can be recovered from its surface and if the cervical lesion is followed by a typical secondary exanthema.

Eight personal observations have been added by the authors to the few cases found in the literature of secondary lesions of the cervix. Syphilis manifests itself upon the cervix in the form of macules, papules, and ulcerations. These forms probably represent three successive stages in the development of a lesion caused by scattered accumulations of the *spirochætæ pallida* in the squamous mucosa of the cervix. The parasite can readily be recovered from the secretion of any of the three forms, and this explains the great infectiousness of secondary lesions. Wassermann is positive in this stage. Macules and papules have no symptomatology of their own while ulcers may give rise to a profuse yellowish discharge. Occasionally, a peculiar puffiness of the fornices may be present. The leucoplastic appearance of macules, the characteristic form of the papules, and the typical yellowish color of the ulcerations render diagnosis comparatively easy. Secondaries in other parts of the body form a valuable aid. Cervical lesions as a rule heal quickly and may disappear without leaving any traces. Specific treatment, energetically applied, brings about resolution in a very short time.

Actual knowledge concerning syphilitic lesions of the uterine body is extremely meager. Primary and secondary manifestations have not yet been observed in the uterus. A few instances of gumma in the uterine wall have been recorded. An isolated observation by Hoffmann proves the possibility of gummatous changes in the endometrium. This infrequency of tertiary lesions is a matter of surprise, for the uterus more than any other internal organ of the body is exposed to direct infection. *Spirochætæ* may reach the uterine cavity from the vagina or lesions of the cervix. It is certain that an actively syphilitic mother invariably infects the foetus. In every pregnant syphilitic woman *spirochætæ* must be present in the endometrium. Unless syphilitic lesions of the uterus have been overlooked in the past, we are forced to assume a relative immunity on the part of the uterus.

It seems possible that the tubes may be the seat of luetic lesions, but the pathological and clinical material on record is yet too incomplete to permit of positive assertions. *Spirochætæ* have never been found in the tubes of syphilitic women.



Various changes in the ovaries (simple enlargement, syphilitic oophoritis, tertiary sclerosis of the ovary, ovarian gumma) have been described as typical expressions of the secondary and tertiary stages of luetic infections, but in no instance, with the possible exception of Hoffmann's case, has positive proof been furnished that such alterations are actually due to a local luetic process.

The fact that in some syphilitic patients either an amenorrhœa or, more commonly, a metrorrhagia, disappears after specific medication cannot be accepted as evidence of a syphilitic ovarian lesion. Spirochætæ have as yet not been demonstrated in the ovaries of adults.

Syphilis of the pelvic cellular tissue appears in the form of a diffuse gummatous infiltration which secondarily involves the pelvic peritoneum. To the few cases on record the authors have added a personal observation. In almost all instances a wrong diagnosis of malignancy has been made. In their own case the positive outcome of the Wassermann reaction together with other unmistakable signs of tertiary syphilis about the outer genitals aided in arriving at the correct diagnosis. Specific treatment produces amazingly quick improvement of an apparently hopeless condition.

Syphilis may be the causative factor of disturbed menstrual function for various reasons. Impairment of general health and disorder in the harmonious synergism of all endocrine glands through the affection of one may in the course of a luetic infection interfere with normal ovarian activity. Therefore, in syphilitic patients specific medication may correct a menorrhagia or metrorrhagia which has proved refractory to the customary modes of treatment. Such prompt therapeutic effect, however, does not permit of a diagnosis of luetic processes in the uterus or in the ovaries, because uterine lesions probably never, and syphilitic ovarian lesions, if actually existing, are but rarely responsible for abnormal uterine hæmorrhages.

The Wassermann reaction is found positive in a very large percentage of patients suffering from metrorrhagias. This is not surprising. Luetic women through the common complication with gonorrhœa and as the result of frequent abortions are particularly prone to develop gynecologic anomalies in which irregular uterine hæmorrhages represent a predominant symptom.

The authors recommend a trial with specific therapy before radical treatment is decided upon for all cases in which a uterine hæmorrhage is not definitely explained by local findings.

Normal cervical secretions may contain spirochætæ during the secondary stage even though there are no specific lesions about the genitalia. This has been definitely proved by the authors by actual observation. The search for spirochætæ may become as important a part of our diagnostic technique as is the stain for gonococci. The prognosis as to the danger from infection as well as the time of cure may depend upon such an examination.

As regards the uterus, and more particularly the cervix, convincing proofs of the interrelations of syphilis and cancer are meager, and it is necessary for the present at least, to rely chiefly on the analogy with other regions of the body. The following four possibilities suggest themselves:

1. An alteration of all tissues of the body caused directly or indirectly by the syphilitic virus—*Gewebsumstimmung* of Neisser—whereby the defensive apparatus of the organism is weakened.

2. Any part of the body which in the past has been the seat of a syphilitic lesion becomes a *locus minoris resistentiæ*, wherein a cancer may develop.

3. Leucoplacia may represent the connecting link between syphilis and cancer.

4. The direct transition of syphilitic into carcinomatous tissue.

Microscopic sections are introduced to illustrate the probable mode of such transformation. Unless arrested in time by antiluetic treatment, atypical cell proliferation, such as is stimulated by the syphilitic lesion, may lead to carcinoma.

While actual and well-established facts regarding syphilis of the female genital organs are comparatively few in number in contradistinction to the many theories and the volume of literature on this subject, yet enough is known to compell and hold the interest of the gynecologist.

Syphilis may cause organic lesions in all parts of the genital tract such as ulcerations and tumefactions. The gynecologist will be able to properly interpret and treat such lesions only if he is familiar with the local pathology of syphilis. He may also meet with functional disturbances within the genital sphere not explainable by any local findings, which may be due directly or indirectly to the influence of syphilis.

There are close analogies between the genital organs in the male and the female from a purely developmental and anatomical point of view. The fact that the ovaries correspond to the testicles, the tube to the epididymis, the uterus to the prostate, has seemed to many writers sufficient to base deductions as to the pathology of syphilitic lesions in the female upon their knowledge of luetic lesions in the male. Such reasoning is faulty. Syphilis in many respects affects woman in a manner essentially different from man. After all, there is nothing in man to compare with disturbances of menstrual function which so often confront the gynecologist.

Gynecology has in the past profited by the pioneer work of dermatology in the realm of syphilis. It is now time that the gynecologist should contribute his full share. There are still many mooted questions, such as syphilis without primary lesion or the pathology of local lesions in the female genital tract, which the gynecologist is amply fitted to solve.

He should also fall in line with the representatives of other specialties in advancing the problem of the relationship between cancer and previous syphilitic lesions in the same locality.



Familiarity with syphilitic lesions in the genital tract must needs prove of eminent practical value to the gynecologist in view of the frequent confusion in the diagnosis of cancer and syphilitic ulcerations or gummata. That occasionally a patient is subjected to a serious radical operation who could have been cured by antiluetic treatment there can be no doubt.

A more intimate interest in the problems of syphilis of the internal female genitalia will advance gynecology both in its theory and in its practice.

#### MISCELLANEOUS

**Coffey, R. C.: Surgical Treatment of Gonorrhœal Tube Infection with a Quarantine Pack.**  
*Surg., Gynec. & Obst.*, 1916, xxii, 228.

The author emphasizes the importance of differentiating gonorrhœal from pyogenic tube infection, for in the former case the tube once sealed rarely functionates, while in the latter pyogenic infection most tubes may be restored to function by proper drainage. The pack is made by laying wicks all the way across the pelvis in a complete wall, the wicks extending to the bottom of the pelvis and protruding through the abdominal wound. Above this pack of gauze wicks four thicknesses of gutta-percha tissue in the form of a large sheet is used to protect the intestine from contact with the gauze.

During the past eight years more than fifty cases of gonorrhœal tube infection have been operated upon in the very acute stage, with no mortality. In four of these the operation was performed so early that the tube had not sealed, but a considerable quantity of pus could be squeezed out of the tube. The quarantine pack was placed, attack cut short, and in no instance has the patient had trouble since. In two other cases where the tubes were firmly sealed the tubes were ligated and a stump left. In both instances it was necessary to do a second operation to remove the stumps. In all other cases excision of the uterine end was practiced, followed by the placing of the quarantine pack. In all cases the attack was cut short at

once, and in none of this group of cases has a second operation been necessary.

The author's conclusions are: (1) Acute, violent tube infections are best treated by early abdominal section. (2) If the tubes have not firmly sealed, the pelvis should be quarantined with a pack and the tubes allowed to remain unharmed. (3) If the tubes are firmly sealed, they should be excised and the uterus and ovaries isolated from the intestines by a quarantine pack.

The author believes that many more tubes and ovaries will be saved by this method than by the so-called "conservative" method, and that the usual sequelæ following gonorrhœal tube infections will be markedly decreased.

**Leeuwen, G. A. Van: Some Remarks Regarding Useless, Therefore Undesirable, Operations**  
(Quelques remarques à propos des opérations inutiles, donc indésirables). *Arch. mens. d'obst. et de gynéc.*, 1916, iv, 433.

Many hysterical women in whom the genital apparatus is absolutely normal, consult gynecologists for pains in the lower abdomen, which they refer to the uterus or adnexa. In many such the indicated diagnosis is—no genital anomaly: hysteria.

In examining such women who have come to his gynecological clinic in Amsterdam, Van Leeuwen found in a great number a cicatrix of a former appendectomy. He found that the result of such operation was favorable in 40 per cent of cases but unfavorable in 60 per cent. The unfavorable results were generally in cases of chronic appendicitis.

Diagnosis of chronic appendicitis is difficult, especially in women, yet it is often made without sufficient reason. It is confounded very often with hysterical pains and anomalies. The operation which is done on these hysterical subjects is naturally insufficient. It is even harmful, because since operation has failed to relieve them of imaginary pain they will now believe that there is something abnormal in their lower abdomen.

Such operations based on wrong diagnosis are not only damaging to the patient, but to medical science.

W. A. BRENNAN.

## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Van Slyke, L., and Vinograd-Vilchur: A Quantitative Test of the Abderhalden Reaction.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 290.

Owing to the great uncertainty which has been associated with the Abderhalden reaction, the authors have worked in the hope of providing a quantitative method sufficiently accurate, simple, and specific for proteolysis to make the results definite and free from subjective influence. They confined themselves to a study of pregnant with normal serum. They utilized placenta prepared in three different ways.

As a standard method for measurement of serum protease the aminonitrogen determination seemed to them particularly promising for the following reasons: First, it is quantitative and permits of accurate results with a small amount of material. Second, it is specific for proteolysis. The change of the non-aminonitrogen of proteins into aminonitrogen is characteristic of protein digestion, and the extent of this change affords a direct and quantitative measure of the extent to which proteid digestion occurs. The method, since its publication in 1910, has been used successfully in studies of protein digestion by various investigators.

As nearly as possible the same amount of placental tissue was used in every case. The utmost care was taken to avoid bacterial contamination, and the technique was controlled by means of repeated cultures with negative results. The chemical manipulations were simple, clear-cut, and quantitative. Duplicate controls always gave closely agreeing results.

Practically every serum, whether from a pregnant or non-pregnant individual, showed some definitely measurable degree of digestion when incubated with placental tissue. The range of individual variation in proteolytic activity was wide. The results with normal sera cover in each case a range which includes most of the results from pregnant sera. After a year's work using the utmost care, the authors found that the individual variations of both pregnant and non-pregnant sera make the results from both overlap so completely as to render the utilization of the reaction, even with a quantitative technique, absolutely impracticable for either a positive or negative diagnosis, even of pregnancy.

C. H. DAVIS.

**Evans, D. J.: Eclampsia.** *Canad. M. Ass. J.*, 1916, vi, 110.

The author is of the opinion that true eclampsia is, on the whole, a rather rare complication of pregnancy, and that a preponderant proportion of cases

diagnosed as eclampsia are really cases of renal insufficiency or nephritis; in other words, that in the larger proportion of cases the toxæmia is due primarily to defective kidneys, while in the remainder, the hepatic type, the renal involvement is purely secondary. That it is possible to make a diagnosis of true eclampsia during life is thus open to question.

As a general rule, toxæmia occurring late in pregnancy is attended with a marked increase in the general blood-pressure. In all cases of pregnancy presenting signs or symptoms of toxæmia, the blood-pressure should be systematically observed. A rising blood-pressure, associated with toxic symptoms, headache, constipation, œdema, epigastric pain, disturbed vision, albuminuria, etc., are indicative of danger, and a pressure of 150 mm. may be considered as the danger limit.

As regards treatment, every individual case must be studied and no single method of treatment is applicable to all.

In the presence of evident symptoms of toxæmia in the later months of pregnancy, associated with albuminuria and casts, and an increased blood-pressure, eliminative and sedative treatment is indicated. One must rely on milk diet, hot baths, the copious use of fluids and purgatives, together with rest in bed, to bring about improvement. If there be no improvement, indicated by the subsidence of the albuminuria, reduction of blood-pressure and disappearance of the general symptoms of toxæmia, then labor should be induced. Venesection, sweating, the employment of morphia and chloral in moderate doses, with purgation and the free use of fluids, constitute the treatment of a case of actual convulsions. In cases at or near term, active surgical methods of delivery may be undertaken, but only to save the life of the child, as such operations, unless attended with considerable hæmorrhage, seem to have but little influence in relieving the condition of the mother. EDWARD L. CORNELL.

**Diehl, H. E.: Eclampsia; Studies Concerning Its Causes, Nature, and Treatment.** *N. Eng. M. Gaz.*, 1916, li, 72.

As a general average eclampsia occurs in 0.3 to 0.6 per cent of all cases of confinement: 20 per cent coming ante-partum, 60 per cent during labor, and 20 per cent puerperal. The general predisposing causes seem to be primiparity, heredity, contracted pelvis, multiple pregnancy, previous renal or hepatic disease, and an unstable nervous equilibrium. Properly speaking, eclampsia is but one, and the most severe as well, of the toxæmias of pregnancy.

The author reviews the various theories as to the



cause of eclampsia and concludes that all cases probably do not have the same origin.

At present and until the cause be specifically known, the treatment is indefinite and a matter of routine.

First, however, there are the preventive measures. Symptoms suggestive of impending eclampsia are headache, nausea, vomiting, seeing spots before the eyes, with dimmed vision, epigastric pains, insomnia, or an abnormal desire to sleep, twitchings, cedema, high blood-pressure, and albuminuria. When such symptoms are present dietary measures should be taken—especially avoiding proteins and foods rich in cellulose; also attention must be given to the eliminative channels. If these do not suffice, premature induction of labor is decidedly called for.

After convulsions have occurred there are two methods of treatment: (1) to deliver the patient at once; (2) delivery in no case but attempting to control convulsions by the administration of morphia or chloral or both and venesection.

Remove toxic material by any rational means possible, replacing the same by saline intravenously or by colonic irrigations. Assist labor when it is developing or when the patient's condition does not improve.

If actual operative measures are needed, provided there be no dilatation of the cervix, the choice of methods rests between abdominal cæsarean section, vaginal cæsarean section, and instrumental dilatation of the cervix. Vaginal cæsarean section seems to offer the best chance for the mother in that it seems to involve the least shock and the least chance of sepsis.

C. D. HOLMES.

**Raab, F. H.: Indications for the Advantages of the High Incision in Cæsarean Section.** *J. Mo. St. M. Ass.*, 1916, xiii, 76.

The author gives the following indications for cæsarean section:

1. *Absolute indications*, i.e., conditions which admit of no other means of delivery: (1) contracted pelvis, as a flat pelvis where the true conjugate is less than 7 cm. and the child normal in size; (2) neoplasms of the pelvis, uterus, adnexa, cervix, vagina, rectum, if sufficient to cause obstruction to the birth canal so that a normal birth is prevented; (3) additional indications, cicatrices of the vagina, or cervix, some cases of ventral fixation, ruptured uterus, tonically contracted uterus, accidental hæmorrhage; (4) eclampsia—by this method of treatment the maternal mortality has been reduced nearly one half; (5) placenta prævia is thus best treated, as it offers the best chance for both mother and child; (6) condition of the foetus—one with a non-moulding head, impacted breech or face, or prolapse of the cord, where infection has been avoided.

2. *Relative indications*: These are cases where cæsarean section vies with forceps delivery, podalic version, pubiotomy, accouchement force, etc. Such cases include pelvic deformity, certain cases of

placenta prævia, tonic contraction of the uterus, some eclamptic cases, also moribund women where operation is done in the interest of the child, or to give temporary relief to the mother.

3. *Contra-indications* (1) where attempts at delivery have been made from below; (2) where it is suspected that vaginal examinations have been made without aseptic precautions.

*Operation*: Choice of time to operate. It is best to wait until labor has begun to be sure the foetus is mature. However, in a large per centage of cases the operation is an emergency operation. A high incision in the uterus is of distinct advantage for the following reasons: (1) the abdominal opening is smaller than in the low type of incision; (2) abdominal and uterine wounds are separated by contraction and involution of the uterus which lessens the chance of adhesions, (3) uterine incision is made through the part of the organ away from the layer of blood-vessels which lessens the danger of hæmorrhage; (4) incision is made in a portion of the uterus less likely to rupture in future pregnancies; (5) there is less escape of intestines and omentum which lessens the shock and post-operative disturbances; (6) there is less probability of subsequent hernia.

C. D. HOLMES.

**Bell, R. G.: Cæsarean Section in a Pitman's Cottage.** *Brit. M. J.*, 1916, i, 195.

The author reports a cæsarean section performed under unusual difficulties, in a case of contracted pelvis. The two previous labors had ended in the sacrifice of the children. Operation was successful in this instance, a living child was delivered, and the patient had a smooth convalescent puerperium. Exception might be taken to the opinion expressed by the author that many major abdominal operations could be done quite as well at the patient's home as in the hospital. Certainly with the history of the case in hand transportation to the hospital could have been effected long before the time of the operation, the need for which was evident.

PHILIP F. WILLIAMS.

**Tweedy, E. H.: The Lower Uterine Segment, Its Origin and Boundaries.** *Lancet*, Lond., 1916, cxc, 565.

It requires only a very minute portion of the upper portion of the cervix to suffice for the growth of the lower uterine segment. We must think of the cervix as growing large rapidly rather than of its being rapidly stretched. These changes in the growth of the cervix result from stimulation by direct pressure exercised by the ovum during the latter half of pregnancy and during labor. To understand the progress of the growth of the lower uterine segment, it is important to keep in mind certain established anatomical and physiological features. The endoperitoneal tissue forms an important diaphragm for the pelvis. Its fibers are inserted into the muscle bundles of the uterus and may be considered the tendinous extremities of the



latter. The diaphragm is held in tension by the uterine muscle; it supports the uterus, prevents descent of the contents of the abdomen, and constitutes a barrier which effectively protects the cervix from pressure. The os internum opens at an early period of pregnancy and this relaxation corresponds with Hegar's early sign of pregnancy. Consequent on this opening the uterus and abdominal contents sag downward and the fornices become somewhat shallow. The uterine muscle-fibers are put out of tension by the opening of the os, with consequent contraction and retraction of these fibers and the upward movement of the diaphragm with its attached blood-vessels and ureter. This upward movement produces a still wider opening of the diaphragm, permitting the growing ovum to pass through it and allowing the latter to exercise direct pressure on the structures immediately beneath. Bearing these facts in mind we must conclude that the cervix is not an elastic structure, but, on the other hand, that it has a power of extraordinarily rapid growth when stimulated by continuous pressure. The similarity in the growth of the cervix to that of the growth of the lower uterine segment is very apparent, and we have no difficulty in following its subsequent development into the part known as the lower uterine segment. The ring of Mueller must be considered the undilated portion of the cervix which has as yet not been subjected to direct pressure, and Bandl's retraction ring must consist of the structures which go to form the internal os.

C. D. HAUCH.

**Irving, F. C.: The Systolic Blood-Pressure in Pregnancy; Observations on Five Thousand Consecutive Cases in the Pregnancy Clinic of the Boston Lying-In Hospital.** *J. Am. M. Ass.*, 1916, lxxvi, 935.

In 80 per cent of pregnant women, the blood-pressure ranges from 100 to 130.

In 9 per cent, the blood-pressure may be below 100 one or more times. A blood-pressure below 90 does not mean that the patient will have shock unaccompanied by hæmorrhage at confinement.

In 11 per cent of cases, the blood-pressure may be above 130 one or more times. Age, nationality, and parity seem to have some influence on blood-pressure. High blood-pressure in the young is more frequently a sign of toxæmia than in those over 30.

Elevated blood-pressure is more commonly an index of toxæmia than is albuminuria, and it is apt to be an earlier sign. The degree of elevation points more surely to the likelihood of toxæmia than does the degree of albuminuria. Both, however, are of the utmost importance.

Isolated cases of elevated blood-pressure unaccompanied by albuminuria or evidences of toxæmia occurred not infrequently. Usually they responded to free catharsis. Some pressures remained elevated in spite of treatment and apparently were normal, during pregnancy at least, for the patients who exhibited them.

A progressively rising blood-pressure, often from a low level, even though it never reaches the arbitrary danger point, should be regarded with apprehension as a most valuable sign of approaching toxæmia. Toxæmia is much more common with a blood-pressure above 150 than it is below that point.

Most cases of eclampsia occurred with a pressure of 160 or more. Eclampsia may, however, occur with a moderately elevated blood-pressure.

All toxæmics developed both albuminuria and elevated blood-pressure.

While the incidence of eclampsia in this series is about the same as the figures usually given, it is significant that two-thirds of the patients who developed convulsions absolutely neglected advice and refused to return to the clinic. Had these patients been discharged against advice during pregnancy for disobeying instructions, very favorable statistics would have been obtained. The hospital feels that it would have been most unjust to the ignorant foreigners, who constitute the vast majority of its patients, to desert them when they most needed skilled hospital care. With proper co-operation from the patients and eliminating the fulminating cases which develop in a few hours, there is no doubt that eclampsia would be practically a preventable disease.

EDWARD L. CORNELL.

#### LABOR AND ITS COMPLICATIONS

**Wichmann, S. E.: The High Forceps Operation** (Zur Klinik der hohen Zangenoperation). *Nord. med. Ark.*, Stockholm, 1916, *Kirurgi*, No. 1, p. 11, and No. 2, p. 131.

The author in a very detailed and comprehensive article deals with the clinical data obtained in 200 high forceps operations in the obstetrical clinic of the University of Helsingfors from the beginning of the year 1890 to the middle of 1914. A short summary of each case is given. The matter is so diffuse and extensive that only an outline of the points discussed by the author can be presented in an abstract.

Under the heading of material Wichmann discusses: Choice of the cases; distribution of the material according to differences of maternal pelvis; size of the children; the manner of presentation of head in pelvis; indications calling for high forceps operation; age of the mothers and number of labors.

Under prognosis of high forceps operation, the following points are considered:

1. For the mother: (1) mortality, (2) injuries, (3) post-partem hæmorrhages, (4) morbidity, (5) late results.

2. For the child: (1) mortality, (a) as regards the pelvis and weight of child, (b) age of mother and number of previous births, (c) indication for operation, (d) mobility or fixation of head; (2) causes of death of the children; (3) injuries, late results.

The technique of the high forceps operation by various operators is discussed. Finally the value of the high forceps operation as regards position of the operation in the therapy of the contracted pelvis,



and significance of the resistance of soft parts as regards prognosis for mothers and children in high forceps operations. The article is accompanied by an extensive bibliography. W. A. BRENNAN.

**Mundell, J. J.: Pituitrin in Labor.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 306.

The author has reviewed the rather extensive literature which has accumulated on this subject during the six years this extract has been used in obstetrics. He has collected reports of 3,952 cases in which it has been used and gives a table showing the unfavorable results which have been reported by various writers. There were 6 deaths due to rupture of the uterus, but in each case the records show that these fatal cases were due to the misuse of pituitrin. He finds a foetal mortality of 21 in 3,952 cases and a maternal mortality of 7.

This study shows the need of careful analysis of all the factors in the case before reporting the good or bad effects of such a powerful extract as pituitrin.

C. H. DAVIS.

**Skeel, A. J.: Analgesia and Anæsthesia in Obstetric Practice.** *J. Am. M. Ass.*, 1916, lxvi, 797.

In labors not distinctly abnormal, morphine is used during the first stage, and only when the labor is expected to last at least four hours longer. The author's indications for morphine during the first stage are:

1. A rigid, hypersensitive os.
2. Evidence of considerable pain, with a probable first stage of several hours, as in most primiparæ.
3. The presence of nagging but ineffectual pains which irritate and exhaust the patient out of proportion to results.

Accordingly, many patients, particularly primiparæ, get a single hypodermic of one-sixth grain of morphine.

At the beginning of the second stage, or if the patient suffers severely, shortly before dilatation is completed, the use of gas is begun. Intermittent administration is made at first, that is, during the pain only, and with small amounts, as 30 gallons of nitrous oxide to 15 gallons of oxygen. As the head approaches the pelvic floor and finally strikes the perineum, the nitrous oxide is gradually increased in volume to 50 or 60 gallons and the intervals between administrations are shortened. This gradual increase of the volume of the gas given is controlled by the patient's statement of pain or comfort during uterine contraction. As the perineum begins distending and the most painful stage of labor arrives, the gas is given still more continuously until, at the time of crowning, from 70 to 80 gallons of nitrous oxide are given practically continuously. When the head is born, the nitrous oxide is at once discontinued and the patient sharply revived by a few inhalations of pure oxygen.

If the woman is a primiparæ with a rigid, inelastic perineum and lacerations seem inevitable, the utmost possible relaxation is secured by switching to ether

and pushing to complete unconsciousness at the moment the head crowns the perineum.

The author enters a vigorous protest against the advice at present being so freely given that anyone may use gas in labor cases with perfect safety. Gas is a powerful therapeutic agent with infinite possibilities for harm at the hands of incompetent or careless users. The statement has been made that gas in the hands of an expert is a safe anæsthetic, but the most dangerous anæsthetic if given by a novice. This is far too strong a statement to make concerning analgesia. Even here, however, some knowledge and experience are necessary to secure both safety and satisfaction from its use. Moreover, the temptation to follow a gas analgesia labor with a gas anæsthesia for repair is so obvious that all those who expect to adopt this method should spend sufficient time in special study of the agents they are to use so that they can direct its administration. This does not mean that a doctor must equip himself as a gas expert. The skill necessary for its use in labor can be acquired in a short time, but free use of gas by the absolutely inexperienced will surely lead to tragedies. EDWARD L. CORNELL.

## MISCELLANEOUS

**Francis, L. M.: Treatment of Ophthalmia Neonatorum.** *Buffalo M. J.*, 1916, lxxi, 344.

The author not only discusses the treatment of ophthalmia neonatorum but also those features in its management which are of interest to the general practitioner. The article may be summed up as follows:

1. Not all ophthalmias of the newborn are gonorrhœal; 30 per cent are due to other organisms, as the staphylococcus, streptococcus, etc.
2. There are two classes of ophthalmias, those primary infections occurring at the time of birth, and those where the infection occurs secondarily from extravaginal sources.
3. Early diagnosis is imperative. All new cases of ophthalmia must be regarded with suspicion until proven to be of a benign nature; smears should be made early.
4. In unilateral infection, the other eye should be protected, and the attendants warned of the danger.
5. Because of the frequent serious corneal involvement gonorrhœal ophthalmia should be under the care of the ophthalmologist.
6. Careful and intelligent nursing is as important as medical advice in these cases. C. D. HOLMES.

**Barnert, C.: Treatment of Gonorrhœal Ophthalmia.** *Med. Rec.*, 1916, lxxxix, 239.

The author has used cresatin in a number of cases of gonorrhœal ophthalmia and finds it an excellent drug. Cresatin is a phenol derivative of very powerful germicidal properties, entirely free from the corrosive, destructive, action of the ordinary phenols.

The duration of gonorrhœal ophthalmia under



this method of treatment is twenty-four to forty-eight hours after the first application. In most cases one application was found sufficient; in none were more than two such treatments given. Gonococci were rarely found after the first application; where they did so appear a second application effectively disposed of them.

The technique is as follows: A 25 per cent solution of cresatin in albolin is used. The conjunctival sac must first be cleared of secretion by means of a stream of warm physiological saline or saturated boric acid solution, preferably through an undine. This is followed by the instillation of a drop or two of a one per cent solution of holocaine or cocaine to prevent the slight irritation of the next step. A small cotton swab is used to apply a drop of cresatin to the mucosa of the conjunctival sac. It is imperative to cover the entire surface of the mucous membrane in this application. The after-treatment consists in keeping the conjunctival sac free from pus, and the repetition of the application, should occasion demand. RALPH H. KUHN.

**Hannah, C. R.: Injuries to the Infant, Produced at Birth.** *Texas St. J. Med.*, 1916, xi, 539.

The author discusses the various causes for birth injuries, and gives the histories of four cases of long and difficult labor followed by injuries to the infants.

It is in cases of contracted pelvis that the infants suffer most. Here the use of the forceps produces a depressed fracture, a concussion of the brain, or an intracranial hæmorrhage, any one of which may cause a permanent pathological change which in later life may explain paralysis, headache, epilepsy, and other existing maladies. Usually these injuries are the result of the unscientific application of the mechanics of delivery; brute force is substituted for proper and thoughtful manipulations. Prolonged and hard labor pains, which prevent a change in the foetal blood, are frequently found in cases of generally contracted pelvis, and in cases with rigid and unyielding perineum.

In conclusion, the author emphasizes the following points:

That neglect of frequent observance of the foetal heart-sounds costs the life of many a child.

That a slow irregular foetal heart-beat or an excessively fast one signifies foetal danger.

That the presence of lumpy or sea-green meconium in the liquor amnii in cephalic presentation may mean compression, and failure to recognize this fact hazards the life of the foetus.

That pituitrin may cause tetanic contractions of the uterus, and if so, an interchange in the placental blood may be prevented, which would produce hypercarbonization.

That an irregular and slow foetal heart, or an excessively fast one, or the presence of meconium in the liquor amnii, are symptoms which indicate that the foetus must be delivered or it will probably die.

That if an attempt to deliver is made it should first be made certain that the child can be delivered alive, and that it will probably live and, second, that the mother will not be injured.

That an internal hæmatoma, causing internal pressure, should be removed early or pathological destruction of the nervous system will take place, which may cause deformities, imbecility, epilepsy, and other forms of degeneracy. RALPH H. KUHN.

**Davis, E. P.: Syphilis in Its Relation to Obstetrics.** *Tr. Am. Gynec. Soc.*, Washington, 1916, May.

Davis believes that the most positive diagnosis of syphilis in the parturient woman and her offspring is made by recognizing spirochætæ. These parasites are found in the walls of the umbilical vein and in the connective tissue of the umbilical cord. This gives an opportunity for examination in suspected cases without exposing mother or child, or arousing alarm or suspicion. The parasites are never found in the amnion, but occasionally in the chorion. When found in the placenta they are in the villi and in the walls of these tissues. Should the resistance of the placenta be successful, they will probably be destroyed by the cells of the villi.

Syphilis may be diagnosed from the placenta when gummae, placental abscess, or marked overgrowth of the connective tissue of the placenta is present. Normally, the comparative weight of the placenta and child is as 1:6, while in syphilis the proportion is 1:4, indicating the marked increase in size of the syphilitic placenta. Where the mother is syphilitic, although the child escapes, the spirochætæ are found in the cord in over 50 per cent of cases, and where both parents are syphilitic, the placenta shows evidence of their presence in 70 per cent. Syphilis is transmitted from foetus to mother through the leucocytes of the umbilical vein, or through ruptured vessels of the villi. So far as foetal infection by syphilis is concerned, the paternal element is much less important than was previously supposed.

The spirochætæ are found abundantly in the organs of the syphilitic foetus, and are present in three-fifths of all macerated foetuses.

Where the spirochætæ can be found in the blood of either parent, or in tissues removed from lesions, the diagnosis is positive. Searching for the parasites, the fact must be kept in mind that bichloride of mercury, 1:5,000, causes the parasites to disappear from tissues, and hence care must be taken lest antiseptic precautions destroy the possibility of diagnosis.

Syphilis may form antigens in the milk, which protect against active infection. The mother is then especially well prepared to nurse her offspring which may be, and probably is, syphilitic. Should the child be syphilitic and the mother absolutely sound, a syphilitic nurse should be secured for the child, but if the mother be syphilitic and the child healthy, the child should be artificially fed. In doubtful cases, it is best to procure a healthy wet nurse.



The majority of writers today believe that Colles' law is no longer valid in view of our present knowledge. The condition known as latent syphilis in the mother, the antigens which her breast milk contains, and the belief that the fœtus conveys syphilis to the mother, are proof against the validity of Colles' law.

Treatment may destroy spirochætæ, but unfortunately toxins produced by the parasites may still poison the patient.

The Wassermann reaction cannot be relied upon for a positive diagnosis of syphilis. Pregnant patients having diseases caused by protozoa or tuberculosis, malignant growths, scarlatina, pneumonia, and eclampsia, may give a positive Wassermann reaction when syphilis is absent. It has frequently been observed that a patient having a negative Wassermann reaction is greatly benefited by antisymphilitic treatment.

Noguchi's vaccine, known as luetin, is useful in preventing the development of tertiary syphilis. It has not been especially successful with pregnant women.

The frequency of syphilis among parturient women is difficult to estimate. Fournier found that among married women in his clinic, 70 per cent had syphilis before marriage, and 40 per cent afterward. In the majority, the first signs of the disease appear within six months after marriage. When histories could be obtained, it was found that the husbands had become infected less than three years before marriage. The first three years after marriage is the most dangerous period of life for the woman so far as infection by syphilis is concerned. Both syphilitic men and women should receive continuous treatment for at least six years before marriage.

In parturient patients syphilis may cause lesions in the genital tract, making spontaneous birth difficult or impossible. The mortality of syphilitic or parturient women is estimated at 73 per cent, largely from mixed infection. Puerperal morbidity is much increased by syphilis, and nephritis may develop in the puerperal period.

It is commonly supposed that syphilis is a frequent cause of abortion, but this is now being denied.

In the living newborn, a diagnosis can be made by examining the umbilical cord, and detecting characteristic parasites in the walls of the umbilical vein and connective tissue. In apparently healthy children, spirochætæ are often found about the umbilicus. The X-ray is especially valuable for it shows in the newborn the osteochondritis which is an important symptom of the disease. Syphilis is a frequent cause of sudden death in frail, ill-nourished infants, in whom there may be no apparent sign of the disease. Children born with syphilis may remain apparently healthy, and develop disease of the joints, the lymphatics, the bones, and the cornea, as late as eight years after birth. Both knees are often attacked, and the bilateral character of the disease differentiates it from tubercular disease of the knee-joints which is unilateral. In these cases the synovial fluid may give a positive Wassermann test.

Seven per cent of syphilitic children die before the end of the first year, and among such tuberculosis develops in 12 per cent.

As regards the frequency of syphilis in the newborn among the poor, Fildes found one infant in 1,015 to be syphilitic at birth, among the poor in the east end of London; 3.9 per 1,000 among the women gave a positive Wassermann reaction. Pemphigus of the newborn is by many not considered a syphilitic, but a streptococcus infection. The characteristic lesions are found in the palms of the hands, in the soles of the feet, and in the peculiar staining of the tissues about the mouth and the anus.

Salvarsan treatment is useful for both mother and child in acute and florid syphilis, but it will not prevent the death of the child *in utero* from toxæmia. The majority of observers use salvarsan for acute and severe cases, and rely upon mercury and iodine to complete a cure. In using salvarsan, the urine should be repeatedly examined to observe the excretion of arsenic. Should this fail, poisoning may result. Many prefer to treat the pregnant woman by hypodermatic injection of a mercurial preparation.

## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**Thomas, G. J.: Clinical Review of 240 Cases of Non-surgical Infection of the Kidneys and Ureters.** *Urol. & Cutan. Rev.*, 1916, xx, 127.

The author analyzes 240 cases of renal infection which received urological treatment in the Mayo Clinic. Tuberculosis and infection secondary to calculus or urinary obstructions are excluded. Frequency of urination is the earliest and most frequent symptom, 76 per cent. Cystitis, however, was noted in only 16 per cent of the cases. Renal pain was the initial symptom in 37 per cent, and hæmaturia in only 7 per cent although present at some time in 41 per cent. Ninety-five cases had bacteriologic examination and 63 per cent of these were colon infections. Thomas argues that the original "offending organisms probably lessen the resistance of the kidney so that the colon bacillus which is constantly passing through the kidney becomes pathogenic." The majority of infections are bilateral and should be considered so until proven otherwise by pyelography and cultural examination. Contamination is frequent, usually from poorly sterilized ureteral catheters or the use of an unsterile lubricant.

In treatment, a careful search for foci of infection, such as tonsils, teeth, abscesses, furunculosis, bone infections, etc., should be made before urologic treatment is instituted. Of local treatment, lavage of the kidney pelvis and ureters every four or five days was most frequently used; lavage with 0.5 to 3 per cent silver nitrate. Of 150 cases which were followed, in 29 per cent the condition remained stationary, improved in 46 per cent, and cured in 18 per cent. Of the 28 cases cured, 6 had autogenous vaccine only; 6, vaccine and urinary antiseptics only; 4, urinary antiseptics only; 2, pelvic lavage; and 2, vaccines and lavage; whereas, 2 cases had urinary antiseptics, vaccines, and lavage. Three cases received no treatment, 2 were operated upon, and one had bladder lavage only. FRANK HINMAN.

**Crabtree, E. G.: A Method of Demonstrating Bacteria in Urine by Means of the Centrifuge; the Relative Value of Examinations by Culture or Stained Sediment.** *Surg., Gynec. & Obst.*, 1916, xxii, 221.

The author calls attention to certain unavoidable errors in the diagnosis of urinary infection where the clinician relies entirely upon cultural evidence. These errors are due to four factors:

1. The tendency of some common bacteria like the colon bacillus when recurring in mixed infections to overgrow other perhaps more significant bacteria.

This occurrence is most troublesome in bladder infections with phosphatic calculi and in coccus infections of the kidney where a colon pyelonephritis already exists.

2. The tendency of chromogenic bacteria to obscure other more significant growths in mixed culture.

3. The possibility of formalin sterilization of small quantities of urine being washed down from a formalin sterilized catheter sufficient in quantity to inhibit growth in culture.

4. Routine culture fails to demonstrate some of the more rare bacterial infections because of unsuitable cultural conditions and media.

He calls attention to the value of stained sediments as a control to cultural examinations of infected urines as a means of avoiding the above errors. By his method of eliminating pus from the centrifuged sediment large numbers of bacteria, including tubercle bacilli when present, are demonstrated. Sufficient evidence as to the nature of the infecting organisms is obtained by stained cover-glass preparations to indicate proper cultural procedures. Contaminations are readily recognized from true infections by the number of bacteria obtained.

**Schmidt, L. E.: The Rôle of Urine Stasis in the Etiology of Pyogenic Kidney Infections.** *Lancet-Clin.*, 1916, cxv, 118.

Urine stasis is probably the most important factor in establishing renal infection. It is generally recognized that, if lowered resistance of a kidney be present, urine stasis may account for pathological changes in the kidney and the sequelæ which occur. Bacterial invasion may take place by these means through the ureters or their lymph-channels, provided that an infectious focus exists in the bladder or the immediate neighborhood. Recent investigations have undoubtedly demonstrated the existence of a lymph-channel between the bladder and kidney by way of the ureter, and this route is, according to the author, the most important source of ascending renal infection.

Owing to predisposing factors existing in women, such as periods of congestion of their genital organs, superinduced by menstruation, pregnancy, and labor, the possibility of the establishment of colon infections of the kidney is greater than in men, and Schmidt believes that this type of infection, although some statistics state the contrary, is more frequently met with in the female sex.

Owing to the close relation of the intestinal tract to the kidney by lymphatic circulation, colon infections of the kidney are easily accounted for, which generally occur on the basis of intestinal congestion



and stasis. In the etiology of urine stasis congenital renal anomalies of formation or location (horseshoe kidney, dystopias with anomalous vessels favoring stone-formation, polycystic kidney, etc.) play an important rôle. Schmidt has observed that many of these conditions are the nucleus for later occurring renal infections. In 11 cases of congenital polycystic kidney, which came to operation, 9 were complicated with infections. The same is true of hydronephrosis, in the vast majority of which, infection sooner or later necessitates operative interference.

Operative injuries of the ureter, obstructive conditions connected with advanced renal neoplasms, parasitic growths of the kidney, and concrements of the upper urinary tract are cited as other and frequent sources for renal stasis and consecutive renal infection. In looking over his operative records, the author found that urine stasis in the pelvis of the kidney was an important factor in infections of the kidney, that in fully four-fifths of his cases the colon bacillus could be demonstrated as the infecting agent, and that but a small percentage of cases are ascending in character.

Owing to the fact that obstructive conditions of the urethra are more prevalent in males, consecutive infectious changes of the upper urinary tract are less frequent in women than in men, a fact that is borne out by the author's statistical compilation of his own material.

The reverse is true of urine stasis due to pathological conditions in the bony pelvis, causing pressure on the ureters, which are by far more common in the female sex. The greater frequency of renal infections in the male, as evidenced by the author's statistics on his own work, is explained on the basis of the preponderance of more favorable conditions for general infections in that sex.

The author concludes his very instructive article by insisting upon early operative relief for the great majority of cases of renal infection as a sequel to urine stasis. A more expectant régime may yield good results in the frequent cases of colon infection consecutive to congestion, while in renal infections due to the more common pus-producing organisms only active surgical measures are fraught with satisfactory results.

M. K. ROTOSZYNER.

**Danziger, F.: An Unusual Case of Kidney Ripping by a Grenade Splinter** (Ein ungewöhnlicher Fall von Nierenzerreissung durch Granatsplitter). *Berl. klin. Wchnschr.*, 1916, liii, 160.

Danziger gives a short clinical report of a very interesting and unusual case of ripping of a kidney by a splinter of a grenade. On operation the kidney was found to be completely torn in two pieces, the ureter which was also torn from the bladder being attached to the smaller piece. The wound cavity was cleaned out and tamponed, the ureter removed, and the vessels in the vicinity ligated. The peritoneum was not injured. After a few days the tampon was withdrawn and the edges of the torn

kidney united and sutured. The hæmorrhage was slight and there were no complications. Recovery was uneventful.

W. A. BRENNAN.

**Stutzin and Gundelfinger: War Injuries of the Urogenital System** (Kriegsverletzungen des urogenital Systems). *Deutsche med. Wchnschr.*, 1916, xlii, 188, 227.

Stutzin, who writes from the German Red Cross Hospital at Constantinople, discusses the most frequent type of injuries of the genito-urinary system occurring in war. He gives the details of the clinical history in ten cases of this kind observed by him. He points out the difficulty of carrying out the complicated diagnostic and operative technique required in such cases at the front; but says that cystoscopy is possible and necessary in the field.

Injuries of the bladder are the most frequent type observed. Where the healing is tardy incision and drainage must be resorted to.

In the case of ureteral fistulæ occurring from wounds without spontaneous healing, nephrectomy is called for. Sectioning of the bladder is generally the rule in the case of urethral injuries. Plastic operations are often required on the genital organs and when necessary the scrotal skin is best utilized. The after-treatment of all cases operated upon for urogenital injuries must be carefully watched.

W. A. BRENNAN.

**Kakels, M. S.: Large Congenital Hydronephrosis in an Infant Six Weeks of Age.** *N. Y. M. J.*, 1916, ciii, 547.

Kakels reports this case on account of its rarity, the youth of the patient, the large size of the hydronephrosis, its rapid progress, and its successful removal by transperitoneal nephrectomy.

The infant was six weeks old, ventricose from birth, and since birth a gradual and increasing swelling of the abdomen had been noted. On examination the whole abdomen was found to be greatly distended, with the swelling bulging from under the costal borders on both sides, and toward the right flank an elongated mass was felt, with fluctuation. The diagnosis lay between a malignant and non-malignant growth of the kidney and was corroborated by the X-ray plate which showed that it was a retroperitoneal growth.

On account of its large size, the growth was extirpated transperitoneally, through the anterior abdominal route, and 900 ccm. of straw-colored uriferous fluid was removed. The sac showed that it was continuous with a greatly enlarged kidney (three times its normal size) made up entirely of a distended pelvis, of globular form, and not pear-shaped. There was neither stricture nor dilatation of the ureter, but from its obliquity of entrance and its anomalous position the author considered these factors the etiological element in the causation of the hydronephrosis.

LOUIS GROSS.

**Ransohoff, J.: Unilateral Hæmaturia.** *Surg., Gynec. & Obst.*, 1916, xxii, 275.

Ransohoff presents a case of pancreatic cyst, with what he believes to be the unique symptom of hæmaturia. The tumor was in the left upper quadrant, projecting into the loin, distinctly fluctuating and of slow growth. When first seen it was nearly as large as an adult head. Cystoscopic examination showed a bloody stream of urine issuing from the left ureteral orifice. Indigocarmine injection demonstrated equal function on the part of the two kidneys.

Ureteral catheterization and radiographing of the renal pelvis was refrained from on account of the weakened condition of the patient at the time of examination. The barium injection of the rectum showed the colon normal.

Exploration of the left kidney by lumbar incision revealed a somewhat larger kidney than normal. A diagnosis was made of cystic sarcomata of the left kidney. Lumbar exposure of the kidney showed it to be normal. Median incision then displayed the cyst of the pancreas, projecting between the colon and the stomach, with the spleen six or eight times its normal size. The pressure of the pancreatic cyst on the renal and splenic vein had produced the hæmaturia and the enlargement of the spleen. The hæmaturia disappeared after the operation.

So far as the author knows, the case is unique, since a search of the relevant literature has failed to show another case.

The pancreatic matter of the cysts was demonstrated by the presence of the three pancreatic ferments: alkaline proteinose, amylose, and lipase. There were also present little masses of saponified fat.

**Macedo, C.: The Periods of Amelioration in Renal Tuberculosis** (Los periodos de mejoría en la tuberculosis renal). *Crón. méd.*, Lima, 1916, xxxii, 33.

From clinical histories the author deduces that during the long periods of arrest or apparent cure of renal tuberculosis, some symptoms improve and even disappear, while others persist, revealing the existence of the primitive pathologic state of the kidney.

The symptoms diminishing in intensity or disappearing are: (1) lumbar pain; (2) frequency of micturition; and (3) hæmaturia.

The clinical signs which persist are: (1) polyuria; (2) albuminuria; (3) pyuria; and (4) bacillus tuberculosis.

Cystoscopic examinations have proved to the author that—(1) acute cystitis of a tubercular origin may develop into a chronic state, with a normal functioning of the urinary bladder; (2) cicatrices of advanced tubercular lesions may be observed; (3) in such conditions characteristic cystoscopic aspects are met with.

Renal tuberculosis starts insidiously and develops without being discovered by the patient or the

attending physician; then it confines itself to lesions of the renal parenchyma, latent tuberculosis.

When the patient has reached the stage of acute tuberculosis, producing symptoms alarming to the patient and permitting of a diagnosis, the tuberculous process is sufficiently advanced to force the abandoning of all hope for a spontaneous cure or medical treatment; the end-result is the destruction of the kidney. Although renal tuberculosis and long living are incompatible, the only salvation of life in such cases rests with the surgeon, nephrectomy being the only treatment available, with the understanding that all depends on the condition of the other kidney and the general condition of the patient.

RAOUL L. VIOIRAN.

**Simmonds, M.: Danger of Pyelography** (Ueber eine Gefahr der Pyelographie). *Muenchen med. Wchschr.*, 1916, lxiii, 229.

In a case in which Simmonds made a pyelographic investigation for doubtful kidney symptoms, the patient died on the third day following. In this case 15 cm. of a 5 per cent collargol solution were injected into the right kidney pelvis. He reviews some other reported cases of death following collargol solution injections.

From the autopsy made in his own case it is clear to Simmonds that collargol poisoning was not the cause of death, but that death resulted from a streptococcus septic invasion. There were apparently erosions in the ureter by which the streptococci had found a mode of entrance into the blood stream. While it is not clear what part the injection may have played in the passage of the microbes, yet a 5 per cent solution was evidently not bactericidal.

Among the dangers of pyelography therefore must be reckoned one that is usually ignored, i.e., septic infection. The surgeon must take special precautions to avoid injuries to the kidney tissues by the infusion, and if the bladder or lower urinary passages are found to contain infective microbes it is better to abstain from pyelography.

W. A. BRENNAN.

**Grossi, V.: Clinical Considerations of Ambard's Constant** (Applicazioni cliniche della costante di Ambard). *Policlin.*, Roma, 1916, xxiii, sez. chir., 41.

Grossi has made an extensive study of the clinical results obtained by himself and others in the application of Ambard's constant. His own experience is based on 51 complete clinical cases in which the constant was observed 77 times. He concludes that Ambard's urosecretory constant is like various other methods of value in examining the renal function, indicating the global alteration of the function of the kidney; and that it can in its extreme limits confirm a lethal prognosis or cause more caution in making an operatory intervention. It is superior to the calorimetric method in cases where catheterization of the ureters is impossible.

In regard to the numerical limitations imposed by



Chevassu, Grossi believes that they have no absolute value and that the interpretation of the constant ought to be made in each individual case according to the clinical criteria and the various causative factors: azotemia, ureic concentration, daily ureic elimination.

In 5 patients dying from renal insufficiency the azotemia was always higher than 1 gram; in one case it reached 5.2 gr. per 1,000; in one case for some few days before death it fell to 0.3 gr. Three cases in which the azotemia was above 1 gr. were operated upon successfully and recovered; 1 died four months later.

The ureic concentration in cases of death was always below 10 per 1,000. The daily elimination was still less and was associated with oliguria. In 2 patients dying from hæmatogenous infection of the kidney the constant and its factors were almost normal.

From the surgical point of view great value should be attached to the ureic concentration and to the daily elimination, which correspond in reality to Albarran's two-hour examination of the global urine and to Cathelin's analogous procedures.

The significance and pathogenesis of the azotemia and of the constant are very far from being clear. In their present state Grossi thinks that we must consider them as simply signs to which it is necessary to attach great importance, perhaps just as much as to the albumin contents of the urine.

W. A. BRENNAN.

**Wechselmann: Intravenous Injections of Lactose Without Reaction: Sclayer's Kidney Test** (Ueber reaktionslos verlaufende intravenöse Milchsüßerinjektionen). *Berl. klin. Wchnschr.*, 1916, liii, 84.

Wechselmann has been using the lactose test for some years past and in many thousands of cases. His experience is that it is very reliable when the lactose is pure and furnishes a dependable index of the kidney functioning. The ill effects which some have found after the use of lactose are explainable as due to the presence of impurities.

W. A. BRENNAN.

**Wyman, M. H.: The Phenolsulphonephthalein Estimation of Renal Function in a Thousand Cases.** *J. So. Car. M. Ass.*, 1916, xii, 84.

The majority of the 1,000 tests were done on surgical patients at the Columbia (S. C.) Hospital, as a part of the routine examination.

An output of 70 per cent or over comes only from normal kidneys.

A 60 per cent output may be temporarily observed in cases where there are at the same time evidences of kidney disease, albumin, or casts, but if the latter do not clear up quickly, the output soon begins to decrease.

When a sound kidney is compensating unusually well for its diseased fellow, we may find a 60 per cent excretion together with albumin and pus.

But in 95 per cent of cases evidence of kidney disease is accompanied by an excretion below 60 per cent.

From the prognostic viewpoint the important thing is whether the curve rises or falls. A man may be regarded as a good surgical risk with an output of but 20 per cent, provided the curve has risen and is stationary.

F. E. GARDNER.

**Hunner, G. L.: Ureteral Stricture; Excluding Cases Due to Tuberculosis and Calculus; Report of Fifty Cases.** *Tr. Am. Urol. Ass.*, St. Louis, 1916, April.

In discussing stricture of the ureter, the author is dealing only with the narrowing of the ureteral lumen due to intrinsic disease of the ureter.

The report of cases is further limited by excluding strictures due to tuberculous disease and those strictures immediately surrounding a stone.

Thus limited, inflammatory stricture is a far more common disease than formerly believed, the author's cases up to November, 1915, numbering 50 as contrasted with 49 nephrectomies for tuberculosis and 39 operations for stone in the ureter.

The author recognizes congenital narrowing as an etiological factor in the disease, but thinks its importance has been greatly overestimated and does not classify any of his cases as due to this cause.

Other causes are gonorrhœal infection probably traveling up the lymphatics from the bladder, and pyelonephritic infections which others have considered as infecting the ureter by way of the urine stream. The author thinks it more probable that the ureteral wall involvement is synchronous with the pyelonephritic infection and, like it, has a blood or lymph stream origin.

Ureteral stricture from the ordinary pyogenic cystic infections is extremely rare. Traumatic cases follow operations, childbearing, and other sources of injury to the ureteral wall.

The author thinks that by far the greatest source of ureteral stricture is some distant focus of disease such as infected tonsils, sinuses, teeth, or disease of the gastro-intestinal tract.

In such cases the disease settles in the ureteral walls and causes the narrowing which in many cases is followed by dilatation and later by infection of the urinary tract.

The symptoms of ureteral stricture are, for the most part, due to the obstruction and are identical with the symptoms of stone in the ureter. Some patients complain only of a more or less constant dull, aching pain in the lumbar region. Others have this constant dull pain with acute exacerbations of pain in the kidney region, and the pain is often reflected down the ureter. There may be bladder and rectal tenesmus. Such attacks may require morphia, and either the pain or the morphia may bring about severe nausea and vomiting.

If infection be present, the above symptoms are likely to be more severe and are accompanied by chills, high temperature, and profound prostration.

The congestions incident to exposure, getting the feet wet, "catching cold," and those due to the menstrual period, are likely to cause partial or complete temporary closure of the inflammatory area and to thus bring about a severe attack of renal pain. Spontaneous local pain at the stricture site is complained of in some cases.

The diagnosis is made on the history, the urine examination, and the physical findings. As above stated, the history is that of stone in the ureter or of pyelitis. The urine may be quite negative, but it usually contains a few red blood corpuscles or a few leucocytes, and it may contain both in small or large numbers. Particularly after a severe renal colic, the urine may be smoky with blood, or if infection be present it may be turbid with pus and bacteria.

The observation that the urine may be quite negative in these cases is a most important one from the diagnostic standpoint. Too often with a negative X-ray and with normal urine it is concluded that the urinary tract is not involved and renal catheterization and the obtaining of a pyelo-ureterogram are neglected. The patient is operated upon for appendicitis, or some form of exploratory laparotomy is done, and the victim continues to suffer or to find partial relief in expectant methods of treatment.

If the stricture be located in or near the bladder wall, it may be palpated as a definite thickening indistinguishable from the infiltration usually surrounding a stone, and cystoscopy in such a case often shows redness and œdema about the ureteral orifice.

If with the above history and urinary and physical findings, one is unable by X-ray and a wax-tipped catheter to locate stone in the ureter, a probable diagnosis of stricture is justified.

Repeated obstruction to the renal catheter at a certain distance from the bladder is further evidence of stricture.

By melting pure beeswax and making a wax spindle on the renal catheter at a short distance back of its tip, one can appreciate the obstruction to this spindle as it meets the stricture, and a more certain diagnostic feature is the "hang" of this spindle on the stricture area as the catheter is withdrawn.

Additional corroborative evidence of stricture is the presence of a hydronephrosis, although a measurable increase in kidney and ureter content may be absent even after years of recurrent renal attacks.

The trauma of catheterization is often followed by a severe renal attack and in the infected cases by a typical pyelitis attack. In suspected ureteral stone or stricture a large catheter, or preferably a large catheter with wax bulb dilator, should be passed to dilate sufficiently to avoid this œdematous closure of the lumen after examination.

The author has seen several cases in which the fluid content of the kidney pelvis was less than

normal. These are usually cases with a prolonged infection which has resulted in contraction of the kidney pelvis in spite of the mechanical obstruction lower down causing symptoms. A pyelo-ureterogram in such cases shows the site of the ureteral stricture and a slightly dilated ureter above this point.

The author takes definite issue with the prevailing opinion that dilatation of the kidney pelvis and ureter are due to infection. Many of his cases with sterile urine and no history of previous infection have the dilated ureter and pelvis.

Of 44 cases with urine report, 16 were sterile; and of these 16, 11 have notes on the kidney content: 3 of these were approximately normal, measuring respectively 8, 11, and 12 ccm.; 7 had a hydronephrosis ranging from 15 to 30 ccm., and one exceptional case with clear urine measured 385 ccm.

Of 18 infected cases, 15 were measured, 4 being of normal or less than normal size, and the pelvis in 11 cases averaging 130 ccm. In this series of cases the average duration of symptoms in the sterile cases was two and a half years, and in the infected cases four years.

The ideal treatment for stricture of the ureter is by dilatation from the vesical approach. Dilatation results in relieving the patient's symptoms and in a shrinkage of the distended pelvis and ureter. If infection be present, dilatation is supplemented by renal lavage, although it is probable that many cases would clear up without the lavage simply by giving the urine free drainage. In the infected cases of long duration, with immense sacculated kidneys, one may be unable to clear up the infection, but after dilatation of the stricture the kidney pelvis shrinks markedly, the urine becomes much more clear, and in some cases entirely clear except for the bacteria and microscopic pus, and the patient is restored to approximately normal health. These facts are of vital importance to those patients with bilateral stricture. In the cases with monolateral stricture and with immense hydronephrotic or pyonephrotic kidney, conservatism often calls for the extirpation of the kidney. This was done in six of the author's cases.

In cases that cannot be dilated by the vesical approach, the author advises extraperitoneal exposure of the ureter and retrograde dilatation. This was done on 8 of his 50 cases, with excellent results in 6. Two of his early cases failed to obtain complete relief, probably because of insufficient dilatation.

Bilateral stricture was demonstrated in 12 of the 50 cases. It is probable that systematic examination would have shown a larger percentage of bilateral cases, as some of these 12 had symptoms on one side only, and the other side was accidentally shown to have stricture in the course of a functional test; or after relief of symptoms on one side the patient returned later with symptoms in the other kidney, and these were found due to stricture in the corresponding ureter.



**BLADDER, URETHRA, AND PENIS**

**Woodall, G. W.: Some Problems in the X-Ray Diagnosis of Urinary Calculi.** *Albany M. Ann.*, 1916, xxxvii, 116.

According to Woodall, the X-ray is but one of three indispensable means of diagnosis in cases of suspected urinary calculi. The other two are: (1) a careful history and physical examination; (2) a cystoscopic exploration and study of the urinary findings from the bladder and kidney.

He groups the cases from a roentgenologic viewpoint into three classes:

1. The X-ray findings may be positive and easily confirmed by cystoscopic and other data.
2. The X-ray findings may be negative and very misleading unless subordinated to other available positive data. Negative cases may suddenly become positive, due probably to some change in the composition of the calculi.
3. Apparently positive X-ray findings may prove to be erroneous when checked by cystoscopic and other means of diagnosis.

Several case histories are given to illustrate each group.

Woodall considers the X-ray to be the most valuable single factor in the diagnosis of urinary calculi and to be of indispensable service when used in conjunction with a carefully taken history and exhaustive study of the clinical aspects of the case. Used alone, however, without proper confirmation by such means as mentioned, it may lead to serious error almost as often as it would furnish a correct diagnosis.

DAVID R. BOWEN.

**Kelly, H. A., and Neill, W.: Cauterization and Fulguration of Bladder Tumors.** *J. Am. M. Ass.*, 1916, lxi, 721.

The author reports two cases in which cauterization and fulguration were done for bladder tumors.

The first case, a female, aged 41, had been twice operated upon for papilloma of the bladder, five and four years previous, respectively. Two years previous, cystoscopy had revealed an ulceration 26 mm. in diameter on the posterior wall. There was a similar area on the vertex 18 mm. in diameter. Repeated fulgurations, covering a period of eighteen months, cleared up numerous tumor masses. At present the bladder is normal except for two small recurrent areas about 4 and 2 mm. in diameter about the right ureteral orifice.

In the second case, a female, aged 38, the cystoscopy revealed a large papilloma attached to and filling the anterior surface of the bladder. Cystotomy showed a growth 1.5 cm. in diameter attached to the posterior wall and three large cauliflower growths on the anterior wall protruding into the urethra and including the left ureteral orifice. Nine tumors in all were removed. There was a recurrence two years later the size of a cherry near the left ureteral orifice, but after fulguration there was no recurrence.

The authors advocate the aerocystoscope (Kelly), its advantage being that it facilitates seeing and treating the pedicle of the tumors, thereby shortening the period of treatment. There are also two slightly diverging needles for fulguration. With the open cystoscope a curved sickle-shaped platinum knife is used. It is hooked around the pedicle and when heated is brought forward through the pedicle.

H. A. KRAUS.

**Freund, H.: Experience with Makka's Operation for Ectopia of the Bladder** (Unsere Erfahrungen mit der Makkas'schen Operation der Blasenektomie). *Beitr. z. klin. Chir.*, 1916, xcix, 99.

In a very comprehensive paper the author reviews a number of original operations by various authors and their modifications, citing the advantages and disadvantages of these procedures in detail. Essentially all operations are considered under two headings, grouped according to fundamental differences in the technique of the operation: (1) In the first group the operator selects the intestinal tract for disposal of the urine. (2) In the second group the operator has in view the formation of a new bladder, having no connection with the intestinal tract. In these differences and characteristics lie the advantages and the dangers of the various procedures. The advantages and dangers of the various operations of Trendelenburg, Maydl, Borelius, etc., are given in detail.

The technique of the Verhoogen-Makkas operation is described, especially the Makkas operation. This operation consists essentially in utilizing the cæcum as a bladder and the appendix as an ureter. The modifications which have been suggested to avoid an ascending infection are referred to. The details are given of 5 cases operated upon by the Makkas method, including the author's case.

The only serious obstacles which might prevent the Makkas operation from being carried out are: (1) the fact that the appendix may have been removed previously; or (2) in cases where the appendix as the result of inflammatory processes may have become so altered as to be valueless; furthermore (3) the cæcum may be fixed normally or by inflammatory adhesions. Freund describes some means of obviating these complications. Against the disadvantages there are numerous decided advantages.

In summing up his experience Freund concludes: (1) Age should be considered; one should not operate on a child under five without serious reasons. (2) A period of from six to eight weeks should elapse between the two steps of the operation, i.e., the preparation of the cæcum and appendix and the removal of the extrophied bladder. (3) Ureteral catheterization and analysis of the specimens prior to operation is important. (4) If pyelonephritis of both sides already exists, operation is not advised.

Although in several cases the operation has been a failure, yet Freund is of the opinion that this is due to the fact that it was not confined to a single

operator, but that in these cases there were two or three different operators. He further thinks that the results obtained in the cured cases are such as to lead to the belief that the Makkas operation is the operation of choice in bladder ectopia.

W. A. BRENNAN.

**MacKenzie, D. W.: Double Urethra with Operation; Review of Literature.** *Surg., Gynec. & Obst.*, 1916, xxii, 344.

The case reported from the genito-urinary service of the Bellevue Hospital was that of a young man 26 years of age, who was admitted to the service in November, 1914.

The patient had been troubled with enuresis nocturna at times since a child; had always passed urine from two openings, one in the normal position on the glans penis and one in the frænum. About 1903 a small lump appeared on the center of the ventral surface of the penis. It was cut down upon and a stone one-half inch in diameter removed from the urethra. The sinus still remained. About six months later a perineal section was performed. This opening also refused to close.

Physical examination showed a well-developed, healthy young man, 5 feet 10 inches in height, weighing 150 pounds; urinary meatus normal in size and position; sinuses, three in number, one at the frænum, one about 1.5 inches from the frænum on the ventral surface of the penis, and one in the perineum.

Rectal examination showed no abnormalities. X-ray of the urinary tract was negative for stone. Cystoscopic examination revealed a normal bladder with a small sacule into which the right ureter opened. The phenolsulphonephthalein output was normal.

Exploration with probes and sounds revealed the existence of a urethra apparently normal except for a slight stricture in the bulb admitting a 26 F. sound. Of the three fistulæ, the posterior perineal one opened into the membranous urethra just behind the stricture. The other two, at the frænum and near the scrotum, opened into a common passage which readily took a 26 F. sound and entered the urethra in the bulb just in front of the stricture.

The perineal sinus was excised, and its opening to the membranous urethra closed. The subadjacent canal was slit from the frænum to the bulb. It was found to be lined with normal mucous membrane, and surrounded, with its companion urethra, by a common corpus spongiosum. It was extirpated completely from the bulb forward. The wound healed by primary intention, and the patient left the hospital passing all his urine through the normal passage.

The male urethra originates from two genetically distinct portions of the embryo, the prostatic and membranous portions resulting from the urogenital sinus, while the remaining portion originates at a later period from the folds of the genital ridge or tubercle.

There are two important points to be settled, according to Lebrun: (1) Is the abnormal canal a urethra or merely some diverticular or canalicular excretory formation? (2) Granted it is a true urethra, how is its formation to be explained?

MacKenzie's conclusions after studying a large number of cases are briefly as follows:

The occurrence of more or less complete duplication of the male urethra, involving the canal from the bulb to the meatus, cannot be doubted, as a large number of well-authenticated instances of several degrees of the anomaly have been recorded. Accessory canals have been described as being about equal in size to the normal urethra and freely communicating with it in the bulb, as in Meisels' and the author's case. In others one passage was smaller than its fellow with which it connected, or ended in a cul-de-sac. Perfectly authentic cases of accessory urethras extending to the bladder have also been reported.

The pathogenesis of all urethral duplications meets with difficulties, and many explanations have been suggested, the most probable theory referring the formation of a double urethra to anomalies of the epithelial urethral strand in the embryo.

#### GENITAL ORGANS

**Smith, E. O.: Anatomy and Pathology of the Seminal Vesicles.** *Urol. & Cutan. Rev.*, 1916, xx, 76.

The author's report is based on a study of a large amount of post-mortem material and brings out many points of practical value to the genito-urinary surgeon.

In his series Smith found the greatest variation in size and position of the vesicles, and that their angle of divergence from the midline varies in different individuals and in the same individual according to the degree of distention of the bladder. Most of the vesicles at their upper pole overlap the ureter where it enters the bladder; it thus follows that chronic inflammation of the vesicles at this point may constrict the ureter, make ureteral catheterization difficult or impossible, and by back pressure lower the resistance of the kidney to infection.

The main blood supply of the vesicle enters at the upper and lower poles, consequently careful ligation should be done at these points in removing the vesicle. The peritoneum occasionally was found to extend well down on to the vesicle and the danger of entering the peritoneal cavity should be borne in mind in operating in this vicinity.

From the clinical standpoint the most important feature of the vesicle examined by Smith was the presence of multiple sharp angulations in the tubule offering very poor natural drainage. This shows that massage of the vesicles to be effective should avoid trauma and that satisfactory surgical drainage can only be secured by multiple incisions. In seeking for a source of "focal infections" the vesicles should never be overlooked.



Calculi were not found in any of the vesicles examined by the author and from his experience he does not believe that because a vesicle is nodular it is necessarily tuberculous. H. L. SANFORD.

**Plaggemeyer, H. W.: Tuberculosis of the Seminal Vesical and Epididymis.** *Urol. & Cutan. Rev.*, 1916, xx, 134.

Tuberculous infection in the genito-urinary tract is as a rule secondary to a focus elsewhere in the body, usually in the lungs, intestines, or bones. Primary tuberculosis of the genital tract has been demonstrated by a number of observers.

Guisy in 183 cases of urogenital tuberculosis found 10 cases involving the prostate and seminal vesicles alone. Saxtorph in a series of 205 cases noted 9 such occurrences. Walker found that the disease was stated to be primary in genito-urinary organs in 52 out of 174 cases; but he found in experimental infections that the lungs were nearly always involved and showed the most advanced process.

Generally speaking, genital tuberculosis is rare before the fourth month, the percentage increasing to a maximum in the third and fourth decade.

In early life both sides are often affected, but after 12 the majority of cases are unilateral. In Barney's series of 153 cases of epididymal tuberculosis, 35 per cent were right, 35 per cent left, and 30 per cent bilateral.

The great mass of evidence points to the epididymis as the most common seat of primary infection in the genital tract. Cabot says, "We should recognize that urinary tuberculosis is primary in the kidney and genital tuberculosis primary in the epididymis." Walker found in 279 cases that the kidney was first involved in 184, the epididymis in 80, the prostate in 6, and the seminal vesicles in 2. Keyes holds that the weight of evidence goes to show that in many if not all cases the prostate or vesicle is tuberculous before the epididymis becomes so. There is much authentic evidence that the epididymis is in most cases affected first.

Whether the normal seminal vesicle can harbor the cast-off tubercle bacilli without being affected, or whether its secretion has a deleterious influence upon these organisms is as yet an unsolved problem.

Considering the rarity of primary infection of the seminal vesicle and the developmental analogy of the seminal vesicle and the urinary bladder, the method of attack upon the kidney in bladder tuberculosis suggests the same rule in the vesicles and epididymis.

Much argument and many experiments have been put forth to prove extension of infection in each direction, via the vas, some holding that extension can take place only in the direction of the current, and others that a reserved parastitis is produced by irritation. Ascension by the subepithelial lymphatics and the blood stream helps to explain the passage of the disease upward without general involvement of the vas. Ascension seems to be the rule; descension the exception.

When tuberculosis involves the epididymis above, epididymectomy should be performed. If both epididymes are involved, double epididymectomy is indicated. Masculinity is not impaired, and sterility has usually already taken place.

It is questionable if orchidectomy ever is indicated.

When both epididymes and testes are involved, it is better to incise and drain. The removal of a massively involved vas, if advisable at all, is best done by the high operation of Cabot. Removal of the epididymis and contiguous portion of the vas has had a signal effect on the process in the vesicles, the infection receding and the vesicles becoming fibrous.

If the process is confined to the vesicle, vesiculectomy as advocated by Young is a splendid operation, but if the prostate also is involved it should not be performed.

The prognosis of primary tuberculosis of the genitals in children is usually good, there seeming to be a limitation of tubercular processes in all organs in children except the meninges. In later life the tendency to wider involvements is a strong argument for radical operation.

Hygienic and climatic treatment both pre- and post-operative is of importance. The author favors the Corbus idea of active immunization before operation.

The conclusions reached in the report of the Massachusetts General Hospital is that until ten years has elapsed no patient can be said to be cured of tuberculosis.

In conclusion, genital tuberculosis in the male is a grave affection, and, except in the case of children, operation affords the best means of cure.

The primary focus being removed, the survival of the patient depends on the ability of his body to immunize itself against the disease. H. G. HAMER.

**Staley, R. W.: Treatment of Non-tuberculous Inflammations of the Seminal Duct.** *Urol. & Cutan. Rev.*, 1916, xx, 131.

Surgical treatment of acute epididymitis has received considerable attention in recent years.

Epididymotomy is a simple operation and can be done in the office under local anæsthesia. Pain is relieved promptly and resolution takes place more rapidly than by the expectant plan of treatment. Mild cases usually resolve fairly promptly under palliative treatment. The more severe cases justify epididymotomy. Relapsing epididymitis, not dependent upon prostatic, seminal vesicles or posterior urethral infection, are most successfully treated by total extirpation of the affected epididymis.

Acute deferentitis usually yields to palliative treatment and rarely demands surgery except when abscess formation takes place, in which case drainage should promptly be instituted.

The inaccessibility of the seminal vesicles and prostate has prevented more frequent use of surgical measures in acute conditions of these organs.

On this account palliative measures must suffice in the milder cases, and surgery be reserved for cases of well-defined abscess. Fuller's incision or that of Young and Squier will be necessary to reach the vesicles, while a slight modification of lateral lithotomy will be sufficient in the case of prostatic abscess.

Non-operative treatment of acute prostatitis and vesiculitis includes rest in bed, application of heat by means of the psychrophore, restricted diet, antipyretic. All urethral manipulations should be omitted except catheterization when retention occurs. After acute symptoms subside, massage is indicated, and in the declining stage dilatations of the posterior urethra are of definite value.

Irrigations of the vas, ampulla, and vesicle with argyrol or protargol by Belfield's method is helpful in those cases where much debris is expressed by massage. In perivesiculitis with impotence, not improved by massage or irrigations through the vas, a carefully performed vesiculotomy sometimes will restore the sexual function.

Gonorrhoeal arthritis is relieved in many instances by non-surgical measures, but vesiculotomy or vesiculectomy may be necessary for permanent relief in some cases. Vaccines, bacterial derivatives, and phylacogens have been generally disappointing.

The conclusions are: Epididymotomy represents a decided advance in the treatment of acute epididymitis. Dilatation, massage, and irrigation will benefit and control the majority of cases of prostatovesiculitis. Irrigation of the vesicle through the vas in properly selected cases is curative. Vaccines have some brilliant successes to their credit, and should still have a place in the treatment of these disorders.

H. G. HAMER.

**Silverberg, M.: The Prognosis of Prostatitis.** *Calif. St. J. Med.*, 1916, xiv, 60.

There are two methods of determining the condition of the prostatic gland: (1) its palpation through the rectum and (2) the gross and microscopic examination of the fluid expressed from the gland. He states that the palpation of the diseased gland may be misleading in that it may be perfectly smooth and of uniform consistency, but is usually slightly more sensitive to touch than the normal prostate. Irregularities in the size and shape of the gland are relatively common and are hard to interpret. In the microscopic examination of the expressed secretion the presence or absence of pus-cells and their relation to the number of lecithin bodies present should be noted. These findings are subject to the following errors: (1) the distribution of the pathological elements may be uneven and the material used in the examination may be from the normal portion of the gland; likewise the marked involvement of a small focus may furnish enough pus to diffuse throughout the entire specimen and the error would be made of diagnosing a diffuse disease of the gland; whereas in reality there is

present only a small focus of disease. The third factor in determining the prognosis is the reaction of the patient to the various treatments.

The author states that these conditions sometimes clear up without treatment, but usually do not. Most of the cases persist with a marked obstinacy. He states that after a given method of treatment has been used for a few weeks if the patient does not improve the method should be changed either in whole or in part and this plan should be persisted in until a method suitable for that particular case is obtained. The author summarizes as follows:

1. It is desirable that prostatitis be cured in every case, but treatment frequently fails or is otherwise unsatisfactory.
2. The outlook is an important matter to the individual as well as from the standpoint of social hygiene prophylaxis.
3. The probable issue is suggested by the history, clinical findings, and by closely following the effects of treatment.
4. There is really no scientific method of establishing prognosis, though bacteriology may avail here.
5. The duration of treatment is uncertain.

V. D. LESPINASSE.

**McCarthy, J. F.: Some Features of Importance in the Diagnosis and Prognosis of Urogenital Tuberculosis.** *Surg., Gynec. & Obst.*, 1916, xxii, 330.

The author calls attention to the importance, in urogenital tuberculosis, of investigating the deep urethra as well as the bladder. He comments on the frequency (hitherto insufficiently emphasized) of the associated involvement of the urethral structures even in the presence of unilateral renal tuberculosis.

Attention is also called to the fallacy of operative procedure such as epididymectomy, etc., without the most careful inspection of the posterior urethra.

The author feels that, while it is generally recognized by urological surgeons that operative intervention such as nephrectomy, etc., for tuberculosis should be regarded merely as the preliminary step in the treatment of a constitutionally tuberculous subject, altogether too little emphasis is accorded this fact in operative clinics as well as the hospital care of such cases.

Finally, he emphasizes the supreme importance of universal state care of the "surgical" tuberculous, non-operative and post-operative subject, from the economic and humanitarian standpoint.

#### MISCELLANEOUS

**Hanzlik, P. J.: Hexamethylenamine as a Urate Solvent and Diuretic, and Its Effect on the Reaction of Urine.** *J. Lab. & Clin. Med.*, 1916, i, 321.

The author exhaustively reviews the literature in order to find the truth about the alleged urate and uric acid solvent properties of hexamethylenamine.



mine. The chemistry and behavior of various so-called urate solvents indicate only very slight chances of success under the conditions existing in the body.

Urate or uric acid solubility depends largely on the degree of reaction (hydrogen-ion concentration) and the concentration of fluids, and there is no evidence to show that hexamethylenamine has any particular influence in this respect.

Recent and reliable evidence shows definitely that therapeutic doses of the drug impart to the urine no demonstrable uric acid or urate solvent qualities. Excessive doses impart only slight and practically negligible solvent effects. A greater action would be obtained at a much lower cost with any of the common alkaline diuretics.

There is no evidence that hexamethylenamine can dissolve urate calculi.

No substance has yet been discovered which would form either soluble or easily oxidizable compounds with uric acid, under the conditions obtaining in the body.

F. E. GARDNER.

**Zobel, A. J.: Genito-Urinary Symptoms Arising from Anal, Rectal, and Colonic Diseases, and Vice Versa.** *J. Am. M. Ass.*, 1916, lxvi, 496.

Ulcerative conditions in and about the anal region, such as fissures, chancres, chancroids, and perianal eczemas are reflexly the cause of frequent and painful urination. In acute proctitis, in acute dysen-

tery, and in the presence of inflamed and ulcerated hæmorrhoids, there is sometimes reflex dysuria and vesical tenesmus due solely to an irritable rectal condition. Cancer of the rectum is usually so insidious in its growth that an anuria may be one of the first symptoms of the disease. A syphilitic stricture of the rectum is also apt to be quite insidious in its formation, and may give rise to scarcely any rectal symptoms, even though it has developed a considerable degree of constriction of the bowel.

Abnormalities in the urine resulting from colonic conditions solely, are occasionally met with. Trans-parietal infection through the lymphatics from the intestine may be the cause of a cystitis. An enlargement of the inguinal glands occurs with chancre of the anus. Urethral stricture, polypi in the urethra, especially of the deep urethra or its adnexa, phimosis, stone in the bladder, gonorrhœa in women, and enlargement of the prostate gland, are some of the more common reflex causes of anal itching. On the other hand, the author states that he has seen a very severe scrotal and perineal pruritus caused by lesions entirely within the anal canal.

Neoplastic growths of the bladder, prostate, and seminal vesicles may give rise to rectal symptoms such as are common in the early stages of rectal cancer. In consequence of abscess formation from disease or injury to the genito-urinary tract, a fistulous tract opening into the rectum is very liable to result.

H. A. MOORE.

# SURGERY OF THE EYE AND EAR

## EYE

**Verhoeff, F. H.: Rosacea Keratitis and Certain Other Forms of Marginal Keratitis, Neuropathic in Origin; Treatment by Pericorneal Neurotomy.** *Arch. Ophthalm.*, 1916, xlv, 148.

Not generally known is the fact that with acute coryza and gastro-intestinal disturbances, herpetic lesions limited to the periphery of the cornea and of a highly distinctive character may occur.

The author contends that as they are uniformly located 1.5 mm. from the limbus, this shows that they occur at the terminations of the conjunctival nerves in the cornea, and lesions situated 3 or 4 mm. from the limbus are explained by assuming that some nerve branches extend unusually far.

Since it is generally accepted that facial herpes is neuropathic in origin, it is regarded as altogether probable that these peripheral corneal lesions are likewise so, and the author's explanation of neuropathic keratitis in general is that impulses from the affected ganglion cells pass backward along the ordinary sensory nerves to the nerve terminations in the cornea, where they produce, by electrolytic dissociation, toxic substances injurious to the tissues.

Rosacea keratitis is also regarded as a form of neuropathic keratitis, and acting on the above theory the author does a partial peritomy to interrupt the injurious impulses, with the result that in fifteen cases operated on during the past year he has secured prompt healing in all, with no recurrences.

Rosacea of the skin, being regarded as an angioneurotic condition due to some abnormal constituent of the blood, he correlates with the corneal lesions by assuming that the same deleterious agent acts on the gasserian ganglion and through this on the skin and cornea.

S. S. HOWE.

**Dehogues, T. L.: Treatment of Gonococcic Conjunctivitis by Autogonococcic Serum** (Tratamiento de la conjuntivitis blenorragica por el suero antigonococico). *Rev. d. med. y cir. de la Habana*, 1916, xxi, 99.

The author reports 8 cases successfully treated. The first hypodermic injection of the serum consisted of 1 ccm. Subsequent injections of 2 ccm. were made every three or four days. After the fifteenth day of treatment no gonococci were found in the secretions. Corneal ulceration was found in one case, but was slight and yielded to special treatment. There were no phenomena of anaphylaxis, and no nervous symptoms.

W. A. BRENNAN.

## EAR

**Smith, S. M.: Aural Complications of Influenza.** *Therap. Gaz.*, 1916, xl, 165.

Otitic influenza like other inflammatory changes due to the bacillus of influenza is distinguished by the intensity, rapidity, and virulence of action, frequently involving the mastoid and other adjacent structures, with absence of the usual symptoms. The initial observable inflammatory process is a severe myringitis, hæmorrhagic in character, with spontaneous rupture of the membrana tympani in forty-eight hours. Early free incision of the membrana tympani with rest and general eliminative treatment are the best prophylactic measures.

ELLEN J. PATTERSON.

**Packard, F. R.: Report of a Case of Acute Mastoiditis, with Influenzal Meningitis; Treatment by Operation on the Mastoid and Anti-influenzal Serum.** *Tr. Am. Otol. Soc.*, Washington, 1916, May.

The patient, a young girl, eleven years old, following severe chilling, developed what was apparently a grippy attack and an acute otitis media in her right ear. The author incised the membrana tympani and evacuated some pus and the next day she had distinct symptoms of a mastoid involvement, accompanied by some stupor, marked Kernig's sign, photophobia, and muscular rigidity of the neck. The mastoid was opened and at the same time a lumbar puncture was performed. The fluid withdrawn from the spinal column showed an influenzal bacilli. Flexner's anti-influenzal serum was injected into the spinal column. Several such injections, each of which was followed by marked improvement in the patient's condition, were used in the course of the week subsequent to the mastoid operation and the development of the meningeal symptoms. The child's mastoid wound did well, the meningeal symptoms practically subsided and marked drowsiness developed, with a recurrence of the symptoms of meningeal irritation. The diagnosis of abscess of the temporosphenoidal lobe was made and the cranium opened and pus evacuated. The child then made an uninterrupted recovery.

**Dench, E. B.: Acute Mastoiditis with Unusual Symptoms Indicative of Intracranial Involvement; Operation; Recovery.** *Tr. Am. Otol. Soc.*, Washington, 1916, May.

The patient, a young woman aged 17, was operated upon for mastoiditis on the eighth day after the inception of an acute otitis media. The



mastoiditis was found to be of the hæmorrhagic variety. Convalescence was slow, and six weeks after the operation the patient was again admitted to the hospital suffering from severe headache, general neurasthenic symptoms, and mental depression. At this time there appeared also an abducens paralysis upon the affected side. There was no evidence of any labyrinthine involvement, and no aphasia, the spinal fluid was negative, and the ophthalmoscopic examination showed each ocular fundus normal.

On account of the severe headache, a large area of dura was exposed in the middle cranial fossa, and the dura stripped up from the floor of the middle fossa as far as the apex of the petrous pyramid. No extradural collection of pus was found, and no collection of pus was found in the old mastoid wound. The patient made a complete recovery. The headache immediately disappeared, and the abducens paralysis disappeared. A rubber tissue drain had been inserted deep in the middle cranial fossa at this operation. Three days after the operation, swelling of each optic papilla was noticed — more marked upon the operated side. The rubber tissue drain was removed, and the optic neuritis rapidly disappeared.

While the case presents many of the symptoms first described by Gradenigo, it differs from them in that in these cases some purulent focus has usually been found at the time of operation, the presence of which explained the symptoms. In this particular case, no such focus was found. It seems probable to the author that the cause of the unusual symptoms was a low grade of inflammation spreading along the dura to the apex of the petrous pyramid, as an area of dura in the middle fossa was exposed at the time of the mastoid operation. This meningeal inflammation probably caused a certain amount of pressure upon the gasserian ganglion and also upon the sixth nerve, causing the severe neuralgic pain in the head and the paralysis of the sixth nerve.

**Dench, E. B.: Obscure Cases of Mastoid Involvements.** *N. Y. M. J.*, 1916, ciii, 529.

This report does not deal with cases where the diagnosis is so evident that it can be made by a glance at the patient, but rather with those cases in which the development of the inflammatory process is so insidious and the symptoms so slight that a diagnosis is made with the greatest difficulty.

The author reports several cases in which the middle-ear condition had cleared up or was rapidly clearing up, but in which the inflammatory process in the mastoid was rapidly progressing as was demonstrated by the operation. From such cases the author draws the conclusion that the actual cessation of discharge is no absolute indication that the mastoid is healthy. Such being the case, the

author attempts to show how one can tell in a given case of acute aural suppuration that there will probably be serious mastoid involvement, or how one can tell in a given case that any involvement has entirely disappeared when the middle ear has completely recovered.

The following diagnostic signs are mentioned:

1. As to the site of the inflammatory process the author states that inflammations confined to the lower part of the tympanic cavity are much less liable to be followed by serious mastoid infection than cases in which the upper part of the cavity is involved.

2. As to the duration of the discharge, the author believes that middle-ear involvement which does not resolve very definitely at the end of two weeks is one of mastoid involvement sufficiently extensive to demand at least exploratory operation.

3. Concerning tenderness on pressure over the mastoid the author states that tenderness at the beginning does not mean much, but tenderness after the fourth or fifth day is of great significance, and he adds that tenderness over the antrum is of more significance than tenderness over the tip.

4. The nature of the discharge is of importance, as a streptococcus infection is more likely to result in mastoid infection requiring operation than is a staphylococcus infection.

5. The sign upon which the author places most reliance is a narrowing of the external auditory meatus near the drum.

6. Another important canal sign is an actual shortening of the external meatus, a condition in which the entire drum membrane appears nearer to the entrance of the canal than under normal conditions.

7. The above signs acquire additional importance where the opposite canal is normal in caliber and length. Concerning the swelling of the canal caused by furunculosis the author notes that this narrowing is more superficial than the narrowing due to mastoid involvement. When in doubt the author opens the mastoid.

8. Roentgenograms are mentioned as of great assistance.

9. The general symptoms mentioned as of diagnostic importance are persistent headache and sleeplessness.

As to temperature and the differential blood count, the author is not much influenced by their absence.

In closing, the author cites a case illustrative of the diagnostic importance of recurring attacks of acute otitis in pointing to mastoid involvement. The author feels that this sign needs more careful consideration as he argues that these attacks would not recur unless a purulent focus existed somewhere in the deeper structures of the middle ear.

OTTO M. ROTT.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Veasey, C. A.: The Diagnosis and Treatment of Inflammatory Affections of the Nasal Accessory Sinuses.** *Northwest Med.*, 1916, xv, 73.

After alluding to the importance of sinus disease as a causative factor in many gastro-intestinal affections, as well as toxæmias affecting other portions of the body, the author considers the sinuses collectively and mentions the well-known symptoms of headache, tenderness, nasal obstruction and discharge, dizziness and vertigo, as well as aprosexia and neurasthenic symptoms in general.

As to diagnostic methods the author mentions transillumination as one of the best aids. Other aids, as the pharyngoscope, X-ray, puncturing and irrigating the antrum, and the application of suction to the nose, are favorably commented upon.

As to treatment of the acute condition, the author mentions the necessity of securing adequate drainage and ventilation, and this is secured by shrinking the nasal mucosa by the application of a weak solution of cocaine instead of adrenalin, as the latter is apt to produce a secondary swollen condition greater than was primarily present. After the membrane has been shrunk, the author cleanses with a normal saline solution or with a mild alkaline solution followed by an application of a 25 per cent solution of argyrol and an oil spray. The patient is instructed to douche his nose freely with hot normal saline solution every hour or two, and to take deep inhalations every two or three hours of compound tincture of benzoin and menthol, four ounces of the former and one drachm of the latter, two tablespoonsful being used in one-half pint of boiling water. General treatment with calomel, saline, aspirin, and phenacetin is recommended.

The indication for the treatment of the chronic cases is likewise, drainage, whether obtained by the correction of obstructing septal deformities or hypertrophied turbinates. After drainage has been obtained irrigations are advised and when these prove futile, operative interference is justified. The author has little faith in the beneficial influence of autogenous vaccines.

OTTO M. ROTT.

**Gatewood, W. E.: Carcinomata of the Nasopharynx.** *J. Am. M. Ass.*, 1916, lvi, 499.

From a review of the literature, the following points are gleaned:

Carcinomata of the nasopharynx are characterized by a rather long latent period and most of them originate in the vault or on the posterior wall. They are more prone to ulcerate and lead to epistaxis than other malignant tumors of this region. Extension

may take place in four ways: (1) by the inferior or pharyngeal route; (2) by lateral prolongation; (3) by the anterior or nasal route; (4) by the posterior or cranial route.

Carcinomata of the nasopharynx very rarely produces visceral metastases; but as a rule they give earlier adenopathy than other tumors of this region. About 60 per cent of the carcinomata in this region occur in individuals between 40 and 60 years of age; but they have been noticed in children as young as 13, 16, and 17.

OTTO M. ROTT.

**Molina-De Saint Remy, A. H.: Migraine.** *N. Y. M. J.*, 1916, ciii, 588.

Migraine is nasal in origin being due to pressure upon the sphenopalatine ganglion, caused by swelling of the mucosa of the middle turbinate impinging against a relatively high deviation of the nasal septum which disturbs the local circulation and ends in a reflex spasm of the cerebral vessels. The treatment indicated is thorough and complete submucous resection of the nasal septum with care to avoid perforations.

ELLEN J. PATTERSON.

**Callison, J. G.: Papilloma of the Nose.** *Laryngoscope*, 1916, xxvi, 153.

The author reports a case of a true papillary fibroid in a colored woman, aged 40, which had been of 12 years' duration and previously operated upon. When first seen by the author, the left nostril was filled with a growth which presented a dry, dark, and wrinkled appearance. The nasal cavity was so completely filled with the growth that a snare could not be passed around it, much less the site of origin determined. To effect removal a biting forceps was used, and thus its origin from the lower border and external surface of the middle turbinate was determined. Microscopical examination revealed the nature of the growth. Of particular interest was the appearance of the epithelial cells, which retained their columnar character even to the surface. Other features of interest in the histological sections were the intense purulent infiltration of the epithelium and its absence from the connective-tissue stroma, the pus-cells in places collecting into groups and forming cystlike spaces.

The growth had a tendency to recur, so in order to eradicate as thoroughly as possible the base of origin and hence to evert the danger of malignant change, the author intends performing a Caldwell-Luc operation, followed by a radical Mosher operation. After this, careful cauterization of the tissues with a chemical substance such as trichloroacetic acid will be made.

OTTO M. ROTT.



**Dabney, V.: Deaths Attributable to Intranasal Operations and Other Instrumentation.** *Surg., Gynec. & Obst.*, 1916, xxii, 324.

Deaths following cauterization of the nasal mucosa, diagnostic puncture, and irrigation or mere perforation of the antrum of Highmore are not to be expected, but it is surprising that more deaths do not follow probing of sinuses, resecting the septum, or removing the middle turbinate, in part or in its entirety. Polypi removal is more dangerous than believed for the same reasons, as they indicate deep-seated disease and periostitis. Infection is accounted for, by the virulence of the bacteria, opening wide spaces for absorption of toxins, trauma, and continuity of tissue. The lymphatics rarely transmit infection, which travels by the blood stream or by actual continuity as a rule. Cocaine was not responsible for any deaths, though adrenalin was. Numerous authors are cited to show that adrenalin with light chloroform anæsthesia is peculiarly dangerous; even with light etherization it is thought risky. Deaths due to adrenalin were 4; to hæmorrhage, 3; to packing nose for epistaxis, 1; to puncture, or injection of air or fluids into the antrum of Highmore, 10; to probing and irrigating frontal sinus, 3; to polyp removal, 9; to ethmoid curettement, 4; to turbinate operations, 9.

In the author's personal case, following resection of the lower edge of the inferior turbinate of one side, the patient never recovered consciousness from the ether, and died in three days from cerebrospinal meningitis. It was probably a case of latent meningitis before operation. One death was due to exploration of the sphenoid sinus; 9 deaths resulted from resection of the septum. Deaths from invasion of the antrum of Highmore are due to reflex irritation of the vagus through the irritation of the second branch of the trigeminus which supplies the interior of the antrum. It is demonstrable that the interior of the nose is a zone of considerable danger for even the slightest instrumental interference, and that adrenalin combined with a general anæsthetic, especially when used for operative assistance, is not to be lightly employed.

**Blackburn, W. J.: Submucous Resection of the Nasal Septum.** *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 228.

The universally gratifying results in a series of over a hundred operations for submucous resection of the septum leads the author to conclude that a deviated septum may be the underlying cause of many diseases of the nose, throat, and ear. By obstructing the nasal respiration, the resistance of the tissues of the nose and throat are lowered and patients with deviated septa frequently develop ethmoiditis, sinusitis, suppurative otitis media, mastoiditis with brain abscess, laryngitis, bronchitis, chronic headache, deafness, tinnitus aurium, asthma, hay fever, or other neurotic conditions.

ELLEN J. PATTERSON.

**Sluder, G.: A Galvanocautery Operation for the Lower Turbinate.** *Laryngoscope*, 1916, xxvi, 166.

The pathological condition for which this technique is recommended is general swelling (hypertrophy or intumescence) of the soft parts covering the lower turbinates; the clinical condition being for the most part nasal obstruction with or without eustachian tube irritation.

To the anteroposterior incision usually made in cauterization of the inferior turbinate, the author has added: (1) a straight one descending in front at an angle of 45 degrees from a point a little above the line of attachment of the body of the turbinate, to meet tangent the anterior limit of the anteroposterior incision and then descending below it to the level of the free margin of the vestibule, almost to the mucocutaneous junction in the vestibule; (2) two curved incisions on the body of the turbinate posteriorly which are made, operating from the postnasal space, by means of a specially curved cautery tip introduced through the mouth behind the soft palate. One curved incision is made above and one below, each beginning 1 to 1.25 cm. in front of the posterior tip and extending backward to meet on the lateral wall just at the tip; (3) the tip of the cautery is extended forward to a point which is to be the posterior end of the anteroposterior incision and carried backward over the tip to the junction of the curved incisions, or even as far backward as the cartilage of the anterior lip of the mouth of the eustachian tube, especially in those cases associated with tubal irritation.

For all this work the author uses an electrode which has no insulation upon it and which consists of the two copper wires which are united by a platino-iridium tip. This permits the wires to be separated and spread apart as far as 1 cm. if desired, which transforms the narrow tip into a V- or U-shaped end as desired. When this is used on the pull any tissue to be removed can be engaged in this loop and the current turned on, when it acts like a spokeshave.

The author has a definite order of procedure in this work which is as follows:

After anæsthetizing the turbinate and soft palate the latter is forcibly drawn forward by the author's self-retaining palate retractor. A large warm postnasal glass is used as a tongue depressor. The curved electrode is then introduced cold in a horizontal plane, through the mouth into the pharynx. The glass is then slipped back into the postnasal position, and the tip of the cautery is brought forward into the affected nostril, put in place, and the current turned on. First the lower curved incision is made, next the posterior end of the anteroposterior incision, and then the upper curved incision. This completes the work from the postnasal side. From in front the author introduces a straight tip to meet the middle posterior incision and carries this forward until he reaches the anterior end of the incision when he changes the direction of the tip, placing it near the anterior tip of the middle tur-

binate, when it is drawn downward and forward to its prescribed lower limit. The tip used is so hot that if it were once removed from the tissue it would burn itself out.

The author has employed this procedure in more than 1,000 cases extending over a period of seventeen years. Out of this number 3 cases required an anterior packing with Simpson's splints to control bleeding. In none of the author's snare and scissors' operations has the result been so satisfactory as with this method. The author has never seen the permanent drying or crusting mentioned by some men. This method is also applicable to snaring off the posterior end of the inferior turbinate.

Two cases are reported in which deafness, not responding to any of the operations for nasal obstruction, has responded to this method of cauterization especially when the posterior line extended to the anterior tip of the pharyngeal orifice of the eustachian tube. OTTO M. ROTT.

**Kellogg, F. B.: An Improved Submucous Operation.** *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 215.

The author makes his primary incision from high up in front of the deviation on the convex side down to and half way across the floor. Then elevating the membrane above and below the edge of the ridge until the mucous membrane of the convex side is free except along this edge he inserts the blades of a delicate pair of scissors one above and one below the ridge and trims off the edge of the ridge leaving it attached to the membrane. After elevating the membrane on the concave side, he inserts a Bosworth saw under the deflection inside the membrane, saws off the projecting spur in the plane of the septum, removes the spur with forceps, and packs with strips of spunk. ELLEN J. PATTERSON.

### THROAT

**Hays, H.: A Simple Tonsil Operation Under Local Anæsthesia.** *Med. Rec.*, 1916, lxxix, 419.

Using Schleich's infiltration anæsthesia, the author depresses the tongue firmly and separates the tonsil capsule from the anterior pillar working from below up with his double-bladed knife. Then using his modified aneurism needle threaded with stout cord or string, he threads the cord in the deepest part of the tonsil from below upward, ties it and using the cord as a retractor completes the dissection with a Hurd tonsil separator or the index finger. ELLEN J. PATTERSON.

**Shearer, T. L.: The Question of Age in Tonsillectomy.** *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 205.

Tonsillectomy is indicated in adults under 40 years, when the patient has hypertrophied or diseased tonsils or the tonsils are the focus of infection of pathological conditions remote from the tonsil. It is indicated also in malignant disease of the tonsil irrespective of age, followed by radium radiation of the wound.

Tonsillectomy is contra-indicated in any adult suffering from arteriosclerosis, and adults over 45 are treated satisfactorily by the electrocautery. ELLEN J. PATTERSON.

**Friedberg, S. A.: Removal of Tonsils and Adenoids in Diphtheria Carriers.** *J. Am. M. Ass.*, 1916, lxvi, 810.

Several instances have been noted in which the local application of kaolin seemed to be without any effect on diphtheria bacilli. In view of the prompt disappearance of the bacilli in these cases after tonsillectomy and removal of adenoids, the author makes a brief report of the results.

Six cases are reported, five occurring in children. The tonsils were removed after all methods were used to rid the throat of diphtheria. In two days or less the cultures became negative.

In none of these patients did the operation have any different general effects than it has ordinarily. In all of the patients the Schick test gave negative results just before the operation. Six successive negative cultures were required before the patients were discharged.

The results obtained in this series indicate clearly that in persistent carriers it may be necessary to remove the tonsils and adenoid tissue if it is desired to terminate the carrier condition promptly.

The bacteriologic examination should be made with care as it is well known that applications of medicinal agents may destroy the bacilli on the surface while leaving unaffected those in the crypts of the tonsils and the folds of the adenoid tissue.

As to the time the operation should be performed, it is perhaps advisable to wait from two to three weeks after the clinical recovery of the patient. In the case of the chronic carrier no time limit is necessary. EDWARD L. CORNELL.

### MOUTH

**Durante, L.: Tuberculosis of the Tongue.** *Ann. Surg.*, Phila., 1916, lxiii, 143.

In addition to reporting 5 cases of tuberculosis of the tongue, the author gives a very complete bibliography of the literature upon this unusual disease. He has been able to collect about 250 cases, some of which, however, have been recorded without anatomicoclinical details. The reason for the relative infrequency of the lesions on the tongue, an organ which comes in contact with almost all tuberculous infecting material, is due, probably, to two factors; (1) to the particular structure of the lingual mucosa which resists the direct penetration of the bacillus tuberculosis; and (2) to the natural resistance which all striated muscle presents to the lodgment of the bacilli. Almost all of the cases cited occurred between the twentieth and fiftieth year, and no case has been recorded as occurring in infancy, the age in which tuberculous lesions are so common and widespread. From these considerations, the author concludes that the tuberculous process in the tongue



is assisted by such lesions as trauma of the mucosa by pipe stems, by carious teeth, by toxic glossitis, etc., and that as these causes are more frequent in men than in women, lingual tuberculosis is to be expected more frequently in men. Statistics bear out this contention, as Chvostek reports one woman to every four men and Delavan records one in twenty-three.

While theoretically tuberculosis may be localized in the tongue by the blood-vessels, by the lymphatics, by direct infection, or by extension from surrounding organs, practically it is impossible to determine the exact method of infection. Many of the cases reported in the literature as "primary" tuberculosis were not controlled by autopsy so that the term must be accepted in the clinical sense only. The theoretical possibility of a primary tuberculosis of the tongue is practically confirmed by two cases which the author collected in which the patients died from other causes and careful post-mortem examinations gave no evidence of tuberculous infection in other organs. In the majority of cases, the localization was secondary to a tuberculous process elsewhere in the body. From the histologic examination of the tissue removed from the five patients reported by the author and from the statistics collected by him, the indications all seem to point to a hæmatogenous infection as the most common method of infection of the tongue by tuberculosis.

The anatomical forms of the disease do not represent a distinct anatomical entity, but diverse forms of the same evolutionary process, depending upon the virulence of the bacilli, the local resistance of the tissues, and the systemic resistance of the patient, are found in various cases and in various parts of the tongue in the same case. The beginning is always characterized by new formation of tuberculous nodules which may be localized separately in the dermis of the mucosa or in the lingual parenchyma. From this initial localization of the tuberculous process, two clinically different types may originate. The first presents itself initially as a plaque of gray color, somewhat elevated above the surrounding mucosa, hard to the touch, and without inflammatory reaction. It resembles cutaneous lupus, and is very often accompanied by lupous lesions of the buccal mucosa, of the nose, or of the skin of the face. This type is referred to as glossodermatitis tuberculofibrosa, or, should it ulcerate, as glossodermatitis tuberculo-ulcerosa. When, on the other hand, the parenchyma of the

tongue is primarily affected nodular tuberculosis may result or the lesions may become confluent or disseminated in various regions—disseminated miliary tuberculosis of the tongue. The second type in any of its various forms may maintain its anatomic individuality for months or years simulating either a neoplastic lesion or the localization of tertiary lues. The typical tuberculous ulcer has irregular margins, sinuous, soft, and reddened, with a soft yellow base. It may appear in any region of the tongue, but with more frequency on the margins and the tip. The adenitis which accompanies it is often bilateral and slightly painful to pressure. Usually there is not much difficulty in finding the bacillus in tuberculous glossitis, although undoubted cases have been reported without the bacillus being found.

The symptoms vary considerably with the stage of evolution of the disease. The initial period is marked with few or no subjective symptoms. When the ulcerative form develops, there is abundant salivation and some pain due mostly to the passage of food. The pain may limit the mobility of the tongue. In the ulcerative type which is complicated by secondary infection there is usually painful regional adenopathy, but in the closed form of lingual tuberculosis it is often absent.

Diagnosis in the early stage of the process presents great difficulty. Mistaken for epitheliomatous neoplasms, amputations of the tongue with radical removal of the glands of the neck have been done for tuberculous glossitis. Mercurial treatment has been employed in 180 reported cases, showing the frequency with which it has been mistaken for tertiary lues. There are no sure criteria of differentiation, and it is always well in case of doubt to employ the microscopic examination of the tissue of the lesion. This can usually be done by frozen sections during the operation, as was done in each of the cases reported by the author.

The prognosis is favorable when the tuberculosis of the tongue presents itself as a primary and unique lesion. It is generally unfavorable when the lingual lesion is a late localization secondary to a bronchopulmonary process.

The treatment of election, which has been avoided by previous authors, has been operative when the tuberculous lesion of the tongue was single and circumscribed. In the multiple and diffuse lesions, the treatment recommended has been local with the cautery.

GATEWOOD.

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## SURGERY OF THE EXTREMITIES

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# INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1916

## COLLECTIVE REVIEW

### A CRITICAL REVIEW OF THE LITERATURE PERTAINING TO THE RELATION BETWEEN GYNECOLOGICAL AND NEUROLOGICAL CONDITIONS

By RICHARD R. SMITH, M.D., F.A.C.S., GRAND RAPIDS, MICHIGAN

THE present-day broader opinions of gynecologists in regard to the relationship between gynecological and neurological conditions are grounded to a considerable extent on what has gone before. To give an intelligible account of them, it has seemed to me necessary to review historically the literature which has been accumulating ever since the beginning of modern gynecology, back in the seventies and eighties. Before this time ideas relative to this subject were so vague and illy defined that for our purpose they may be discarded, though they had a certain amount of influence on later-day conceptions.

As I look over the literature as a whole I am tempted to divide it into three groups:

1. A group made up largely of older papers and accounts in which a very close and direct association between abnormal conditions in the pelvis and neurological disturbances was assumed.

2. A group based upon experience which showed the fallacy of such older views.

3. A group which must include some of the modern purely neurological literature pertaining to the nature of the neuroses, and a few gynecological papers that have been influenced by it.

It is necessary to say, in presenting a subject so complex and one concerning which there is still so much to be learned, that there has been in the past and is today much dissension from prevailing ideas, especially those that seem dogmatic and extreme. There is no question, how-

ever, but that at various periods certain ideas have prevailed to such an extent as to influence in varying degrees the practice of those engaged in gynecological work.

Modern operative gynecology began with plastic operations upon the cervix and vagina. An immense amount of attention was directed to this field, in which it was found possible to be of so much service to women. It is perhaps only natural that the importance of such lesions became magnified. Lacerations and displacements were soon made responsible, not only for much local discomfort but for remote pain, various disturbances of many body functions, and for serious conditions of the central nervous system, including hysteria, epilepsy, and insanity, without much reference to the complexity and definition of any of these.

Group 1. Storer (1) (note also the subsequent discussion) as long ago as 1869, in the first volume of the *American Journal of Obstetrics*, in his description of a case of "obstinate erotomania," and the various attacks that were made upon the clitoris, vulva, and rectum of this patient, as well as the more general physical measures employed, shows well the state of professional opinion of those days, and how ready medical men were to go to extremes when once the importance of pelvic disorders in the human economy had been pointed out.

Emmett (2) in 1874 called the attention of the profession to cervical lacerations "as a frequent

cause of disease," and in 1876 (3), at the first meeting of the American Gynecological Society, he called attention to "uterine flexures," which he believed were of much importance.

At the same meeting Skene (4) (1876), in his reported cases of uterine and vaginal cicatrices, showed clearly his belief in such lesions as a cause of neurological conditions.

Emmett, himself, as near as I can learn, never emphasized the importance of these lesions as the cause of serious nervous disturbances, though in discussing Skene's paper he made the statement that cicatricial tissue in the cervix was a frequent cause of neuralgia in females, and ascribed it to the inclusion of nerve filaments in the scar.

Engelmann (5) in 1877 read a paper in which he expressed a strong belief in "uterine derangements" as the cause of hysteroneurosis. The paper is typical of some of the extreme views of that period. He says: "By the term hysteroneuroses I would designate those phenomena which simulate a morbid condition of an organ, unaccompanied by any structural sympathetic hyperaesthesia, due to uterine derangements and demonstrated to be unquestionably so dependent by being intractable to direct local medication, but yielding at once upon treatment of the casual pelvic disorder."

Pallen (6) in 1877 stated that diseases of the pelvic organs were a most important cause of insanity, and Edis (7) in 1881 (four years later) gave out his belief that headaches, the morning sickness of pregnancy, uterine epilepsy, asthma, chorea, amaurosis, and other disturbances of vision, aphonia, spasm of the glottis, sensation of choking, and other similar reflex phenomena could be ascribed to uterine conditions. There were dissenting opinions from such extreme views, even at that time, seen occasionally in the discussions (see paper by Bigelow [8], 1881), but nevertheless such opinions, modified according to the individual observer, prevailed very largely and were the basis for acceptance of similar views in regard to the ovaries and tubes which now in the development of abdominal surgery gradually received the chief attention of the profession.

Skene's (9) paper in 1881 is especially valuable in indicating the various directions into which discussion was to run after the injection of this newer element into pelvic problems, for gynecologists were now dealing with an important ductless gland.

It was not until the eighties that operations upon the appendages for inflammatory diseases became popular, and during that decade papers

and discussions dealing with indications and methods occupied a prominent place in gynecological literature. To cure certain pelvic infections, and thereby to remove a physical ailment, was the original indication for such operations, and with many gynecologists the appendages were never or rarely removed except to cure some definite and perfectly apparent pelvic disorder. With others, however, the indications were extended, as had been the case with vaginal and cervical lacerations, to meet many remote morbid conditions, especially those of the nervous system.

As early as 1877 Battey (10) proposed the removal of both ovaries with the deliberate intention of ending ovulation and menstruation. The operation was for a long time spoken of as "Battey's operation." His indications included not only certain malformations of the female genitalia which were incompatible with health, but cases of insanity and epilepsy "depending upon uterine and ovarian disease," and "in cases of long and protracted physical and mental suffering dependent upon nervous and vascular conditions and perturbations which have resisted all means of cure." Battey opened the cul-de-sac through the vagina and removed the ovaries, leaving the tubes. He performed his first operation of the kind in 1872 (11).

It was not, however, until the early eighties, as stated, that the indications for removal of the appendages were commonly extended to remote disturbances in the nervous system. In Carstens' (12) article (1883) we see an example of a commonly expressed opinion of the day. He cites three cases of "hystero-epilepsy" in which Battey's operation was performed (in one instance only one ovary), and expresses firm belief in it. Johnson's (13) case of epilepsy in which the ovaries were removed is another example of the same idea.

Lee (14) in 1887 (note also discussion), at a meeting of the Obstetrical Society of New York, presented the ovaries from a woman suffering from a "hysteromania," and in the discussion following, belief in such a procedure was plainly expressed, although Munde said that the removal of ovaries for mental affections was still sub judice.

Byford (15) in 1888, before the Chicago Gynecological Society, exhibited specimens of ovaries, and showed his belief in their removal for mental affections.

All through this early period, then, we find many indications of a widely prevailing belief in the idea that nervous affections of many kinds



arose with great frequency directly from pathological conditions in the pelvis, real or supposed, or in some disturbances of function there. I think it is fair to say that a goodly percentage of gynecologists accepted these views to a greater or lesser extent.

We do not find until the early nineties distinct signs of a reaction — increased experience and disappointment were teaching that this position was untenable. Operations upon the female genitalia with the principal object of correcting a coexisting neurosis, epilepsy, or insanity, were unsuccessful in so many instances as to lead to grave doubts as to the correctness of such procedures, and gynecologists and others began to remonstrate vigorously against them.

In this earliest group of papers and accounts really belong a not inconsiderable number of others which have appeared since then, and which reflect, often to a marked degree, the ideas which one would think had been effectually dispelled years ago. It only shows how difficult it is to change opinions that have been widely accepted by the profession and which contain, as they usually do, some partial truth. We are constantly seeing evidences of the same tendency to over-estimation in other fields of surgery.

The papers of Bossi (16) (1911-12) and Schockaert (17) (1913) in Europe, and Hall (18) (1904-06) (not so extreme) in America are perhaps the best illustrations we may cite of recent papers reflecting the older views. Other papers are those of Moore (19) (1896), Ward (20) (1903), Huggins (21) (1905), Rosser (22) (1909), and Ballard (23) (1912).

The belief of Bossi (16), whose reports have excited much comment and criticism among European gynecologists, is an example of the extreme views favoring gynecological operations for the cure of mentally deranged patients. He recognizes the usual predisposing factors in psychic disturbances. He states that as active factors we find (1) not the more serious pelvic diseases "as much as the infectious and toxic diseases, especially of the endometrium, proceeding with slow and insidious course, the parenchymatous forms of functional as well as infectious origin. (2) The influence is so much greater when the infectious and toxic injuries of the endometrium are accompanied directly or indirectly by a stenosis of the cervix, or kinking or flexion of the uterus which causes a blocking back of the purulent and toxic secretions of the uterine cavity and their absorption. (3) Nervous and psychic disturbances often appear when in addition to the anatomical injuries (and often without them)

an arrest or lessening of the menstrual function takes place, and as a logical consequence a disturbance of the internal ovarian secretion ensues."

He says, "It must not be forgotten that the character, the form of the neuropsychic phenomena, caused, maintained, or accompanied by these pathological conditions of the uterus, stand ever in relation to hereditary predisposition, to the general condition of the organism, to rearing, family circumstances, and environment."

Mayer (24) (1913) takes Bossi and his pupil Ortenau (25) severely to task. He says, "The things they speak of with such dogmatic certainty are but unjustifiable exaggerations of trivial gynecological conditions." He criticizes Bossi's manner of making a psychopathic diagnosis, it being often done for him by the laity, and says that the evidence Bossi gives that the patients are cured is far from convincing. He thinks that suggestion is the paramount factor in the cures that he claims. Many of these cases are plainly mere hysteria, and therefore "cured" by almost any means. He then criticizes Bossi's conceptions of pelvic diseases and his assumption of conditions and sequences, which are neither proved nor assumed by modern gynecologists. Mayer's clear and forceful criticism would, I think, reflect the attitude of many of us. We may justly ask that such claims as Bossi makes be verified by the experience of scientific workers in the same field, and thus far they have been found to be signally lacking in results.

To return, however, to our historical account, it was, as stated before, in the early nineties that we saw the first decided reaction from the earlier views. Ovariectomy as a method of correcting or controlling a neurosis, epilepsy, or insanity, was perhaps the first to go, but it was followed by a decided modification of ideas relative to other conditions in the pelvis and their relation to the nervous system.<sup>1</sup> Ovariectomy not only failed to correct such disorders in a majority of instances but many were made worse, or the disorder was manifested in other serious ways.

Group 2. This earlier teaching had influenced, to a certain degree at least, the practice of the

<sup>1</sup> For a long time after this the ovaries were uniformly removed by almost all operators whenever it was deemed necessary to remove the uterus. The ovary was also removed, with its fellow tube, whenever an infection of the latter demanded its removal. Experience and better technical methods have taught us the feasibility of saving many ovaries previously sacrificed, and today these important organs are usually retained in the childbearing age unless (1) they are seriously involved by an inflammatory process or by a neoplasm which makes its conservation technically impossible, under which condition the opposite healthy ovary is saved; and (2) unless either or both are the seat of malignant disease or a neoplasm which threatens the continuance of the disease, in which case both are removed; and (3) in radical operations for carcinoma of the uterus they are removed with the uterus and other structures.



wisest and most conservative. This later period is marked by a broadening of professional opinion in regard to gynecological diseases and their relation to other conditions in the economy.

At a meeting of the Obstetrical Society of London in 1891, Playfair (26) read a paper on the removal of the appendages in cases of functional neurosis, in which he gives as his conclusion that the removal of the appendages for such a condition is not legitimate, that in "hystero-epilepsy" and "hysteromania" the results of operation had been so unsatisfactory that it was a procedure of doubtful expediency and not to be recommended. In the discussion Spencer Wells, Priestly Ross (quoted by Spencer Wells), and several others strongly condemn the practice.

Régis (27) (1894) points out the seriousness of the removal of the ovaries, and cites a case of insanity which followed the procedure. We might multiply instances of remonstrance against ovariectomy.

Deale and Adams (28) (1894) made a strong plea for a wider view in gynecology, and Frederick (29) in 1895, in a very practical article, asked for a broadening of the gynecological horizon. Palmer (30) (1903) voices much the same opinion. These were earlier expressions of an attitude which has now become almost universal among gynecologists. Although they recognized the importance of the pelvic organs and their diseases, gynecologists saw plainly that they but shared their importance with other organs, and must be held in proper relationship.

The neurologist took part now more frequently in the discussion. In 1898 Frederick Peterson, F. X. Dercum, and Dunn (31) all criticized strongly the viewpoint of the gynecologist. Peterson said that the field of the gynecologist in the domain of nervous diseases was comparatively restricted and unimportant, and strongly protested against the prevailing tendency to enlarge the field of gynecology by unjustifiable and unscientific surgical intervention in cases of nervous and mental diseases.

Church (32) (1904) before the Chicago Gynecological Society made a strong plea for a broader conception of the neuroses and insanities, and saw but little connection between them and the conditions in the pelvis. He regarded the former as essentially cerebral diseases, not depending upon pelvic conditions, nor to be corrected by "meddlesome" operative procedures.

Patrick (33) (1904) at the same meeting frankly and strongly criticized gynecologists. He stated that they are misled by their skill in removing organs and as to the effects of morbid

anatomy, real or fancied, upon the patient. In his opinion they lack knowledge of the nervous conditions they are attempting to cure, and he expressed doubts as to whether a "half dozen members of the Chicago Gynecological Society would pass a fairly good examination in neurasthenia, hysteria, epilepsy, and migraine." His attitude was typical of the neurologists of those days.

Before passing on to the third group of more modern papers reflecting the present-day attitude of gynecologists, it would be well to make special mention of two phases of the matter under discussion which belong properly to our subject: (1) mental conditions following gynecological operations, and (2) modern views in regard to operations upon insane patients, as proved by actual experience in our insane asylums.

1. Post-operative nervous sequelæ are plainly recognized and a considerable literature is extant dealing with them.

Kaiserling (34) (1906), in a study of 29 cases of nervousness following gynecological operations, states that the condition is common and not enough considered. Most of his patients were in a more or less excited state, complained of sleeplessness, with other familiar symptoms. He believes the condition should be anticipated following gynecological operations, patients carefully followed up, and treatment inaugurated early. He recommends well directed hydrotherapy and other general measures, and lays emphasis on mental therapeutics also as a necessary means to betterment. The earlier cases respond better than the late ones. About half of his cases had suffered from some nervous disorder before operation.

Ostrom (35) (1906) faces the possibility of a post-operative neurosis squarely, and thinks it occurs only in predisposed cases. He also thinks that a not always to be recognized mild septic condition may often be the exciting cause. In cases that develop immediately after operation the prognosis is better than in those that develop later on. Insomnia and digestive disturbances following closely on operation are to be seriously dealt with, since they are often precursors of more serious nervous disturbance.

Crouse (36) (1910) thinks that post-operative pain and other ill results may come from an irritation or an involvement of the nerve plexus already attacked by the original disease. This belief is not commonly held today.

Thibault (37) (1912) says that a traumatic hysteria following a surgical operation is rare, though frequently it follows ordinary injury.



2. Insanity following gynecological operations would seem to be a rare occurrence. Rohé (38) (1893) states that as a result of communicating with all of the asylums of the United States and Canada, he found that in all of the ten years prior to 1893 only 25 patients had been registered in all of these asylums as having become insane following gynecological operations.

Kelly (39) (1906) states that there is nothing peculiar in this association, since it occurs often after operation in general surgery and may follow even a simple fracture. He has seen insanity after abdominal operations only in 8 instances in something over 2,000 abdominal sections.

Croom (40) (1899) cites a case of acute mania with death, following a single ovariectomy. He states as his opinion, however, that in women of sound mind and clean hereditary record such a thing is very rare, and that the insanity occurring after operation usually disappears.

Dolérís (41) (1899) cites a number of cases of systematized delirium, following operations upon the genital apparatus, occurring in "neurasthenic subjects" without nervous hereditary disorder.

Mauclair (42) (1904) regards the post-operative psychoses as rare, substantiating his views by quoting Werth as observing 6 cases in 228 gynecological operations, and Segond as having 4 cases in 642 operations. These statistics would apparently apply to the insanities and not to the simpler neuroses, which we are all aware are more frequent.

Piqué (43) (1906) distinguishes two forms of post-operative insanity — those of septic and toxic origin, and those occurring in old people, due to brain changes, or those mentally weak in whom there exists an intense fear and dread of operation.

Hammond (44) (1906) says: "I don't believe it possible for any psychosis to develop after any operation on the pelvic organs in a healthy brain. . . . The principal cause is a congenitally defective brain. . . . The psychological causes are by no means unimportant — fear of death from operation, disappointment at not being able to bear children, and the consequent curbing of the maternal instinct, the fear of loss of the husband's love, the fear of becoming cold and indifferent to the husband, and the fear of acquired masculinity — all contribute, in a brain predisposed to insanity, a great influence in developing a psychosis." Physical causes and surgical shock also contribute.

Piqué and Briaud (45) (1903) state that pelvic operations do not predispose to psychoses more than other operations.

The papers of Manton (46), Broun (47), Piqué (43 and 45), Taussig (48) (1912), and Régis (49) (1904-05) all reflect a large and carefully judged experience upon insane patients. They all concur in the idea that insane patients should be operated upon for coexisting, frank and outspoken gynecological diseases as one would operate upon the same patients if they were sane. They believe that an improvement in the physical condition may result in mental improvement, but that we cannot expect to cure such patients by operating. Manton (1908) states that he has never seen any insane patients recover purely through a surgical procedure.

The summing up of Broun (47) (1908), who has been assisted by alienists in the psychopathic diagnosis, is worthy of quotation. In what form of insanity may the surgeon benefit his patients?

1. "I think alienists would consider, in the first place, that small group of disorders in which operation aims to reach directly the exciting cause; namely, the psychoses with operable brain tumors, traumatic lesions of the skull, acute hallucinosis with middle ear or mastoid disease, the deliria in connection with local infections, and, perhaps, some of the psychoses accompanying thyroïdism.

2. "Owing to the evident complexity of the etiology which exists, even in the best circumscribed symptomatic group, it is clear that in the general estimation of the value of surgical interference it must be regarded as a procedure ranking with our other therapeutic measures which aim to get the patient as quickly as possible into a condition of bodily comfort and physical vigor.

3. "Manic-depressive insanity is regarded rather as a disorder arising on a constitutional basis and expressing itself in one or more attacks liable to be elicited by a great variety of causes, among which states of physical ill health are very important. In cases where the surgeon can relieve the condition which is wearing on the patient, causing worry, pain, or loss of sleep, good results may be expected to follow, and sometimes recurrence of attacks prevented.

4. "In the alcoholic group the psychoses often develop in connection with some physical disease, especially infectious disorders, and special mention has been made by Kraepelin, Mott, and others of infections in the genital tract, particularly in women, as an important element in causing the outbreak and continuance of the psychosis.

5. "In the infective exhaustive group good results can be expected wherever foci of infection can be attacked and removed, or where any exhausting influence can be checked.

6. "In the large group of dementia præcox, little in the way of permanent improvement can be expected, as it is here probably that certain deeply rooted inherent traits are working with various mental causes to bring about a gradual disintegration of the personality."

With a subject so complex and the neuroses still but partially understood, even by the neurologist who devotes a large share of his time and attention to them, one would hardly expect a perfect unanimity of opinion among gynecologists as to their relationship to gynecological conditions, but years of experience in clinical work and a knowledge of what has transpired in the many years of gynecological history has brought gynecologists very close together. We find that they have come a long way toward the viewpoint of the neurologist; namely, that the neuroses and psychoses are essentially mental in character. They exhibit a marked respect for the mental state of patients who apply to them for gynecological aid, and they consult frequently with the neurologist for whose opinion they have increased respect.

The gynecologist believes that a neurosis has commonly nothing to do with conditions in the pelvis, nor any other physical condition. He believes that septic conditions in the pelvis, or what is more common, those that are so clearly and frankly outspoken as to necessarily cause pain and discomfort, may sometimes act as so powerful a contributing cause as to make their removal an essential element in the restoration of the patient to a state of equilibrium. He believes that these same pelvic lesions at other times, when corrected by operative means, may be helpful in arriving at the same results by putting such patients in better physical condition. He thinks much the same of other physical conditions. He does not operate for trivial or imaginary lesions with the expectation of curing an abnormal mental state. The days of "endometritis," "cervical stenosis," "kinks and flexures," and of "cystic ovaries" are gone. He recognizes clearly the importance of the ovaries in the preservation of nervous equilibrium, and his attitude toward them is one of marked conservation.

With a full appreciation of what it may mean to his patient, he preserves or removes the various pelvic organs with their functions only after a careful consideration of the age, social condition, the demands for the preservation of the child-bearing function, the marriage relation, and menstruation, as well as any other matter that may have a bearing upon her condition of mind,

whenever the pathological condition gives him any choice. A pelvic operation is seldom a matter of mere mechanics. By carefully judging the many phases which a gynecological problem presents, he strives to conserve or attain a satisfactory mental state.

I do not know that we could select two better papers than those of Reynolds (50) (1910), and Graves (51) (1913) to illustrate these ideas. They are practical papers, reflecting thought and experience, and it is safe to say that neurologists would find little room for disagreement with them.

Group 3. To this group belong a number of neurological papers which deal with the progress of neurology and the conceptions of the neurologist, and a very few papers by gynecologists in whom the work of the neurologist is clearly recognized and upon whose ideas and writings the work of the latter is plainly stamped.

During these years the neurologist has not been idle. Adhering persistently to the principle that the neuroses were essentially mental in nature, he has delved deep into the workings of the human mind, and has laboriously studied its phenomena. He is today more than ever satisfied that the truth lies in this direction. In this modern study we hear little from the neurologist concerning pelvic lesions or any other surgical lesions as having any marked bearing upon the mental condition of the patient, the relationship being at best it would seem but an indirect one.

In the medical sense, as Jones (52) (1913) says, "the neuroses are not diseases at all but only in the social sense. A medical disease is a product of an interaction between a given individual and an injurious, non-human environment, whether the latter be a physical trauma or an invasion of micro-organisms. On the other hand, a social disease is a product of interaction between an individual and a certain human environment. Put a little figuratively, it may be said that the neuroses are the result of a conflict between an individual and society, whereas other diseases are the result of a conflict between an individual and nature. This fundamental distinction is often not grasped by members of the medical profession, who commonly regard all diseases from the one standpoint, and the failure to grasp it is an important reason why the pathology of the neuroses has in the past been investigated with signal lack of success."

Whereas practical neurologists, most of them at least, recognize the necessity of looking after the physical condition of the patient as being of



importance in the betterment or cure which they hope to obtain, they are turning their attention more than ever before to mental therapeutics.

There have arisen a number of schools of mental therapeutics, based upon the various truths obtained: First (quoting from Jones), those having as a basis, suggestion; second, reassociation; third, psychoanalysis.

The French have apparently busied themselves more with the various methods in which suggestion was the main form of dependence than other nations.

Dubois (53) (1909), whose memorable work made such a stir in this country several years ago, denying the permanent good results of blind suggestion, appeals to the reason of the patient to overcome his abnormal mental state, with the fundamental idea that under the guidance of the physician the normal mental activities may be thus controlled. It is assumed that the patient is able to reason himself out of his abnormal mental state, and does not sufficiently recognize that the disturbance is an emotional one frequently beyond his control.

One cannot speak of modern neurology without referring to the work of Freud (54), and it would seem well that every gynecologist (and for that matter every practitioner of medicine) should read Freud's writings. It would not be to our purpose in this review to give even a short abstract of his ideas. One cannot but feel that Freud has uncovered many important and far-reaching truths. One has a feeling, however, if he may judge by his experience in other matters, that much needs to be modified, that the connection is often less direct than he has assumed, that less general sweeping statements should have been made, and that the sexual idea fails to satisfactorily explain many of the abnormal mental symptoms with which he comes in contact.

Freud has seemed to me to have emphasized, however, the essentially emotional nature of the neuroses. That it is the emotions of the patient that are primarily affected, which lead to the abnormal manner of thinking and the vast number of physical disturbances of function which have sometimes been erroneously ascribed directly to organic disease of the organs from which the symptoms arise.

Findley's (55) paper (1909) clearly reflects the influence of Dubois. He urges the necessity of treating gynecological patients by mental therapeutics when they present a neurosis.

In conclusion, it would be well to cite at some length the work of Walthard (56), whose several

papers form a distinctly valuable contribution to our subject. Walthard worked with Paul Dubois (Berne) and his pupil, L. Schnyder (Berne), for ten years. His paper "*Psychoneurose and Gynaecologie*" (1912) I am giving almost in its entirety for it is difficult to abbreviate it much and maintain its clearness.

He says the various functions of the female genitalia are not dependent upon the presence of the cerebrum. They proceed automatically in animals without a cerebrum, and in those that have been decerebrated, as do the functions of the circulatory, digestive, respiratory, and urinary organs. They proceed with machine-like regularity, unconsciously and automatically. In women with complete transverse lesions of the spinal cord the same may be observed. Their secretions are normal, they menstruate, conceive, carry the child to term, and go through normal labor.

Mental conceptions (*vorstellungen*), however, have their effect normally upon the visceral organs, among which may be reckoned the genitalia. For example, libidinous ideas lead to increased secretion of the Bartholinian glands. Regularity of function is influenced also by the sensitiveness or irritability (*erregbarkeit*) of the central nervous system of the individual. This sensitiveness may be increased by the various poisons, such as strychnine, caffeine, and camphor, or by the internal secretions such as that of the thyroid. Hunger has the same effect, as does also strenuous physical or intellectual work.

Also in a similar manner the abnormal mental processes of the psychoneurotic individual increase the sensitiveness. This manifests itself by such psychic symptoms as fear, anxiety, inward unrest, a tendency to depression, and the existence of physical symptoms in the form of functional disturbances of various organs. The influence of the mental processes upon the female genitalia is then twofold—the *direct* influence of conceptions working indirectly through the increased irritability of the central nervous system. To illustrate—neurotic women with strong erotic ideas have a constantly increased flow from the Bartholinian glands, and this does not subside until such erotic ideas are corrected. Anticipation of pain, antipathy for coitus or the husband, and fear of pregnancy, even with perfectly healthy genitalia, may lead to vaginismus. A spasm may be excited by the mere thought of anything entering the vagina, as, for instance, the clicking of instruments before examination. Vaginismus then is not a sub-

cortical reflex, but a warding off movement induced by a mental conception.

The body functions are, as said, influenced indirectly and very greatly by the increased irritability or sensitiveness of the central nervous system, brought about by the abnormal mental processes of the psychoneurotic patient. The direct influence is the conceived idea. Now, every individual entertains either with desire or aversion the ideas which touch his interests. These ideas lead to corresponding acts. Whether desirable or undesirable, many conceived ideas cannot end in corresponding action. When such ideas cannot be shut out from further consideration, their continued appraisal leads to this increased irritability of the central nervous system. With the neurotic such ideas become fixed — there is an inability to cease entertaining them, and there is a tendency to exaggerate them. The increased irritability found in such individuals affects the function of many of the organs, the sex organs among the others. The irritability is increased to such a degree that they note sensations which escape the healthier individual.

In the female genitalia we find that this takes three forms: an increase of secretions, an increase in the muscular activities, or an increase in the conscious sensations. The secretions of the uterus, for example, are increased, unassociated with any inflammatory process (simple leucorrhœa). The influence of the psychic processes upon the menses is well known. They lead often to the early appearance or a sudden interruption of the menses, their delay or complete non-appearance. Small quantities of blood may appear between periods. These are but examples. We may have abortion or premature labor, and marked disturbances in labor may be the result of this increased excitability.

In greater degree are the conscious sensations arising from the female genitalia through a psychoneurosis under such conditions. These conscious sensations manifest themselves in the outer genitalia by itching and burning. During menstruation or between periods patients complain of a feeling of bearing down or falling of the genitals. Also they have various pains, variously described, which may give rise to the belief that actual disease is present. In dysmenorrhœa this is frequently a prominent factor. Walthard goes into these symptoms at greater length. He warns against assuming such disturbances to be neurotic manifestations unless the mental processes are shown to be of such a character and *all other causes* for a func-

tional disturbance may be excluded. He says that such patients often present a normal demeanor and that it sometimes takes weeks or even months to uncover their real mental condition.

Psychoneurotic symptoms of the different organs do not disturb all patients alike. As with the psychic processes of the healthy individual the great majority of whose conceptions are passed by, so with the psychoneurotic, the majority of such functional disturbances are unnoticed. Only those symptoms which touch the interest of the patient (that is, which the patient holds as symptoms of disease) are entertained with a sense of aversion, and provoke a feeling of uneasiness and anxiety, and at the same time send her to the physician for relief. All other symptoms are passed by unnoticed and can only be brought out in the examination. Such psychoneurotic symptoms can display themselves in every organ of the body, and therein lies the reason why one seeks the internist, the other the neurologist, and the third the gynecologist.

What have diseases of the pelvic organs to do with the manifestation of psychic symptoms? Walthard states that no one today believes that through any physiological or pathological processes any permanent real change in the thinking processes of the individual from the normal to the abnormal can take place. Even extremists like Bossi admit a certain predisposition to a psychoneurosis.

The influence of any disease of the genital organs on the mental process is principally a psychic one and not, as has been assumed, a physical one. The connection between the two is the increased affectibility (*gesteigerte affectivitaet*). Those who examine many women will find that scarcely in ten per cent of the neurotic patients that come to him is there any gross pathological lesion. Where lesions are found, they are usually of lesser degree, such as an erosion, a chronic endometritis, a movable, retroverted uterus, or a prolapsed ovary. On the other hand, with rare exceptions, there are lacking with such patients gynecological diseases which produce hæmorrhage, loss of flesh, and cachexia. It happens frequently that patients with severe neuroses are quite unaware of serious pathological processes in the pelvis, their attention being concentrated upon other things, as, for example, in melancholia and in hypochondriacal and hysterical conditions. On the other hand, if a disturbance of the genital function touches the interest of the patient, it will at once be noticed in its slightest departure from the normal. The increased "affectibility" of such



patients makes their genital functions a matter of lasting fixation and consideration. We see such disturbances after diminution, delay, or failure of the menses, with its fear of pregnancy. We also see it when menstruation occurs where pregnancy is desired, or at the climacteric, with its fear of the disappearance of youth and for the infirmities of old age. Just so in the matter of sex relations. Only when abstinence or abnormal coitus awakens the ideas of deceit, suspicion, or remorse, which becomes fixed and overestimated, do psychoneurotic symptoms appear. If the anomalies of the genital function call forth conceptions that they are "genitally diseased" or physically sick, so it is again that the increased *affectivitaet* leads to fixation and overestimation, whether the disease is real or only functional in nature. When such ideas can be corrected, the particular disturbance disappears, but not the fundamental abnormal manner of thinking of the individual. This all shows that the relation between the disturbances of the genital tract and the mental disturbances are in the main psychic.

Material disease of the genitals themselves, attended with acute loss of blood or with intoxication, may, of course, bring about psychic disturbances in those so predisposed, disturbances which would not have happened to them in health. They are like the other influences of every-day life—disturbances of temper, suppressed sexual feeling, acute infectious diseases, and intoxications—and are to be regarded as opportunities which inaugurate the psychic symptoms in those so predisposed. The primary predisposing factor is the psychoneurosis resulting from birth and breeding.

Waltherd criticizes the attitude of Bossi and others who hold the existence of a direct connection between the condition in the pelvis and the psychosis. The good results that occasionally follow in such patients in operations upon the genitals for harmless lesions are to be explained by suggestion, but such cures can by no means be relied upon. The personality of the surgeon, and the suggestion that comes to the patient through him, all go to make up the therapeutic result. The patient still remains, however, essentially a psychoneurotic, and such patients he says should be treated by psychotherapy. These ideas he says are much in accord with similar ones of the alienist, the neurologist, or the internist. He urges for the gynecologist the study of psychic neuroses from the standpoint of the neurologist.

In Waltherd's second article, appearing about

the same time, he gives a most clear and concise description of the genital reflexes and their physiology. He divides them into two groups—the subcortical and the psychic—explains each and their correlation. From their behavior under normal conditions he passes to that under pathological conditions. He describes their action as affected by organic nervous diseases and the same under the influence of the neuroses. He shows how the pelvic functions are affected by the influence of the abnormal mental processes, and then goes in some detail into the mental therapeutics which he has evidently obtained in his association with Dubois. The paper is an elaboration of many matters touched upon in the article already reviewed. Its study in detail is well worth while.

The gynecologist will look forward with much interest to the future work of the neurologist and those scientific workers who are endeavoring to learn more of the human mind, for the neurotic patient is to him a daily source of interest and perplexity. I understand that the study of comparative psychology and animal behavior promises to be of material aid in this future work.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

#### OPERATIVE SURGERY AND TECHNIQUE

**Stewart, H. S.: Wound Dressings.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 284.

After discussing the subject the author summarizes as follows:

1. Dried ligatures, drains, pads, etc., do not adhere to wounds.

2. The non-adhesion allows of unlimited wound inspection and fosters healing.

3. The best way to treat wounds may be easily discovered by experimentation with boils.

4. If one wishes to use iodine, calomel 1:1000 should be added to the tincture, and  $\text{Zi}$  of this mixture and an equal part of glycerine to  $\text{Zi}$  of water used. This will prevent tanning and will permit penetration of the tissues.

If the patient has iodine idiosyncrasy, or if for any reason the wound does not do well, the use of iodine should be abandoned at once and 1:5000 nitrate of silver, or its equivalent, substituted.

There is just as much difference in the wound healing of two different patients as there is in two pneumonias, two typhoids, or two gout. Routine treatment may be successful, but frequently it is not; therefore, if the patient is to use  $\text{H}_2\text{O}_2$  plus iodine, the results to be anticipated are either good or deplorable; there seems to be no middle course.

C. H. DAVIS.

**Cohn, I.: Acute Dilatation of the Stomach Complicating Operations on the Extremities.** *Ann. Surg.*, Phila., 1916, lxxiii, 263.

After a very careful review of all the available literature on the subject the author summarizes the experimental, pathological, and theoretical work as follows:

1. The nerve supply of the stomach and intestines is intimately connected with the causation of acute dilatation of the stomach.

2. The inhibitory nerve supply of the stomach and intestine is identical—the splanchnic.

3. Strong impulses applied to the splanchnics cause a cessation of peristalsis.

4. Whether these impulses be the result of trauma, infection, or what not, the effect here, as in shock, is the same—an acute dilatation of the

stomach, with or without dilatation of the duodenum and, in some instances, part of the jejunum.

5. Obstruction by the mesentery and its vessels is not present in over 50 per cent of cases.

6. For the above reasons it seems most probable that we are dealing with a disturbance of innervation, rather than a mechanical obstruction due to compression by the mesentery and its vessels.

In 1902, Conner was able to collect 102 cases of acute dilatation of the stomach, 5 of which followed operations on the extremities. The author has been able to collect records of 9 cases. To these he adds 4 cases as the result of a personal communication with about 125 American surgeons, and one case of his own. The case reported by the author followed an operation for osteomyelitis of the femur. The symptoms did not develop until four and a half days after operation and the patient lived eleven days after its onset. As much as seven pints of fluid was siphoned off at one time. At autopsy the stomach was found enormously dilated and the intestines were somewhat distended, but there was no evidence of an inflammatory process, and no pathology which would throw any light upon the etiology of the disease.

GATEWOOD.

**Kane, E. O.: Use of Fluoroscope to Avoid Leaving Gauze Pads and Sponges in the Abdomen.** *Am. Med.*, 1916, xi, 55.

An easy method of obviating the common difficulty in accounting for gauze pads and sponges after operations, which answers admirably, is as follows:

All gauze pads and sponges are stamped at one corner with a metal button. Under the fluoroscope, with a powerful X-ray machine, this button can be clearly seen at any depth of the abdominal or pelvic cavity, no matter how obese the subject. When there is any dispute or question, after counting the sponges, as to whether or not one has been overlooked and lost within the abdomen, the patient is run into the adjoining X-ray room. Here, by a glance through the fluoroscope or by taking a skiagraph, the question is quickly settled.

An ordinary glove-maker's foot or hand button-stamper and the larger sizes of glove snap-buttons can be procured at a very small expenditure and nothing more is necessary. EDWARD L. CORNELL.

### ASEPTIC AND ANTISEPTIC SURGERY

**Rogers, A.: Toluol as a Storing Fluid for Catgut.**  
*Ann. Surg., Phila., 1916, lxxiii, 312.*

Considerable difficulty has been experienced in finding a satisfactory storing medium for catgut prepared by the Kroenig method whereby the suture material, submerged in cumol, is subjected to a high degree of heat. Owing to its slow evaporation, cumol is not desirable as a preservative. Chloroform has been used, but its susceptibility to deterioration from age, sunlight, and heat makes it undesirable.

Toluol,  $C_6H_5H_3$ , is a very stable compound, is very volatile, and has a pleasing odor. It will not hold water in solution, and as a powerful solvent of fats and fatty acids is of great value in removing these irritating substances found in the raw catgut. Toluol is not irritating to tissues when applied superficially or deeply. It also possesses a certain amount of germicidal power and seems to the author to be much superior to any other preserving fluid used for storing cumol catgut.

GATEWOOD.

### ANÆSTHETICS

**Coburn, R. C.: Notes on Nitrous Oxide Administration.**  
*J. Am. M. Ass., 1916, lxvi, 799.*

Even with the accumulated knowledge gained from several years' experience in the prolonged administration of nitrous oxide (and oxygen), there is still quite a tendency shown by some to disregard essential elements of safety, especially when nitrous oxide, administered with normal oxygenation, does not furnish a sufficient depth of anæsthesia. Increasing the percentage and, therefore, the amount of nitrous oxide inhaled, of course, deepens the anæsthesia and this is often a great desideratum; but the increase in the depth of anæsthesia thus gained simultaneously decreases the oxygenation and herein lurks the danger. Most patients can tolerate decreased oxygenation for a short time and when from experience with this class of patients the anæsthetist becomes emboldened to minimize the danger arising from subnormal oxygenation, sooner or later a patient who cannot tolerate even temporarily a decreased oxygenation reaches the service of such an anæsthetist and serious results sometimes follow very quickly. It cannot be stated too frequently or too emphatically that with an anæsthetic cyanosis is a danger signal that should not be disregarded.

The addition of a small amount of ether to nitrous oxide not only increases the depth of anæsthesia, but acts as a stimulant as well, and in this particular enhances the safety of nitrous oxide. To insist that either straight nitrous oxide or straight ether shall be administered is to limit greatly the use of this most bland anæsthetic and, at the same time, create such a general atmosphere that when it is used, if with normal oxygenation it does not furnish sufficient depth of anæsthesia, the nitrous oxide

is increased by decreasing the oxygen, thus in a greater or less degree endangering the patient.

Proper nitrous oxide administration requires more attention to technique than the other general anæsthetics. Rebreathing through a long tube unnecessarily consumes the patient's energy at a time when it should be conserved and causes an unduly rapid accumulation of carbon dioxide on account of the space in the mask and long tube preventing an immediate and thorough mixture of the expirations with the contents of the bag. Rebreathing certainly enhances the safety of nitrous oxide, but whenever rebreathing is used, the bag should be close to the patient's face.

Nitrous oxide causes more swelling of the soft tissues of the upper respiratory tract than the other anæsthetics and at the same time increases the volume of respiration per unit of time; in its administration, therefore, it is very important to keep the respiratory passages open.

Preliminary medication in nitrous oxide administration is a very important matter. Morphine tends to allay pre-operative fear and renders the induction smoother.

The use of a local anæsthetic to block off the traumatized areas is not nearly so general as its merit warrants. There is no question but that this procedure when properly carried out prevents shock and permits the use of a lighter general anæsthesia, and this is especially shown when nitrous oxide is administered.

EDWARD L. CORNELL.

**MacNider, W. D.: The Inhibition of the Toxicity of Anæsthetics for the Nephropathic Kidney.**  
*J. Pharmacol. & Exper. Therap., 1916, viii, 116.*

The experimental data which forms the basis of this study has been obtained from observations upon 28 dogs. The animals were rendered acutely nephropathic by the administration of uranium nitrate subcutaneously, the dose being 5 mg. per kilogram on two successive days. At the end of this period the animals were rendered partially anæsthetized by morphine sulphate in doses of 0.25 ccm. of a 4 per cent solution per kilogram. The anterior abdominal wall was anæsthetized by a 2 per cent solution of cocaine and the bladder was exposed and the urine expressed. The bladder was then returned to the abdomen and the incision closed.

Two animals were employed in each experiment. One of the animals was given intravenously 25 ccm. per kilogram of a 3 per cent solution of sodium carbonate, while the other animal, which served as a control, was given an equal volume per kilogram of a 0.9 per cent solution of sodium chloride. Both of the animals were anæsthetized by Grehant's anæsthetic in 60 per cent strength. The anæsthesia was allowed to persist for two hours and forty-five minutes. At the end of this time any urine which had been formed during the period of anæsthesia was expressed from the bladder and measured. The kidneys were removed for histological study.



The animals which received the intravenous injection of the carbonate solution showed in every instance a much greater output of urine during the period of anæsthesia than did the animals which received the same volume per kilogram of sodium chloride solution. These control animals (sodium chloride), either became acutely anuric from the anæsthetic or the output of urine, as compared with the output by the carbonate animals, showed a very great reduction.

The kidneys of the control animals showed an epithelium which was acutely swollen and in various stages of necrosis. These changes were most pronounced in the convoluted tubules. Accumulations of fat were marked in the loops of Henle.

The kidneys of the animals which received the sodium carbonate solution showed an epithelium which gave but slight evidence of injury. There was no necrosis of the epithelium. Fat accumulations in the loops of Henle were slight or absent.

In both types of kidneys the vascular pathology consisted in an acute engorgement of the glomerular vessels. There was no histological evidence of degeneration in the glomeruli.

The intravenous use of a solution of sodium carbonate protects the kidney acutely nephropathic from uranium against the toxic effect of Grehant's anæsthetic.

This protection is associated with the histological preservation of the renal epithelium.

GEORGE E. BEILBY.

**McCarty, F. B., and Davis, B. F.: The Use of Warmed Ether Vapor for Anæsthesia.** *Ann. Surg.*, Phila., 1916, lxiii, 305.

As a result of experiments upon animals the authors found no evidences of the superiority of warmed over unwarmed ether vapor sufficient to warrant its general use. Their conclusions are as follows:

1. The amount of heat required to warm ordinary ether vapor as used in anæsthesia by the open or closed methods, or by intrapharyngeal or intratracheal insufflation, to body temperature, is so small as to be a negligible factor in lowering body temperature and in inducing shock in anæsthetized patients.

2. The warming of ether vapor, however administered, is accomplished in the mouth, pharynx, trachea, and primary bronchi, and the anæsthetic reaches the alveoli at body temperature.

3. The quantity of ether required to produce and maintain anæsthesia does not appear to be materially influenced by warming the ether.

4. So-called cold vapor does not appear to be more irritating to mucous membranes than warmed ether.

5. No more mucus and saliva is secreted when anæsthesia is induced and maintained with cold ether than when the ether is warmed. GATEWOOD.

## SURGICAL INSTRUMENTS AND APPARATUS

**Stewart, L. F.: Combination Needle-Holder and Ligature Scissors.** *Surg., Gynec. & Obst.*, 1916, xxii, 489.

The instrument described is a combination needle-holder and ligature scissors, the holder portion of which is of the long shank hæmostat type similar to the Deaver needle-holder. The needle-holder jaw that is superior when the holder is properly held in the right hand has a cutting edge that is slightly curved on the flat. The cutting edge is on the side of the jaw that would lie inferiorly when the right hand is rotated to the right. A scissor blade fits the jaw blade in contour and has a shank with a finger-holder that terminates just anterior to the finger-holder of the needle-holder shank which accommodates the ring-finger. The middle finger fits in the finger-holder of the scissor shank and operates the scissors. The scissor shank has a separate screw lock just anterior to the screw lock of the needle-holder.

The scissor attachment does not affect the strength of the instrument, and the additional finger-holder makes it easier to operate. The scissors being curved on the flat and having a blunt extremity permits slight possibility of injuring structures when cutting ligatures.

The advantages of the instrument to one who ties and cuts his own ligatures is that ligatures or sutures can be passed, tied, and cut, without removing the instrument from the hand or making it necessary to pick up other instruments.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Schwartz, A., and Mocquot, P.: The Immediate Treatment of Head Injuries from Projectiles.** *Practitioner*, Lond., 1916, xcvi, 278.

An outline is given of the procedure in the treatment of head injuries by projectiles, as soon as they are brought in from the firing line. The authors think that every head injury should be operated upon at once because of the fact that cases present-

ing little external wounds may show serious damage to the underlying skull and brain. The procedure consists in the enlargement of the wounds in the skin and bone, the removal of splinters, and also of the projectile when it is present. The projectile should never be sought for in the brain substance at this early stage. Most careful hæmostasis is essential. All wounds are provided with drainage. When the dura mater is intact below a fracture, and is of normal color and consistency, with no

cerebral symptoms apparent, it is not interfered with. If, however, the patient shows cerebral symptoms or if the dura is bulging or shows a blue discoloration beneath it, it is incised and drainage instituted. Penetrating wounds of the skull are the most serious type to deal with. It is necessary to trephine both at the point of entrance and exit of the projectile. Fragments of the skull, if they are loose, are taken out. Great care must be exercised in their extraction so as not to damage the underlying veins during the procedure. Severe wounds with hæmorrhage and protrusion of the brain substance are dealt with in a similar manner. A sufficient area around the wound is cleaned and shaved and prepared for operation as though a craniotomy was to be done in each instance. The authors prefer an H-shaped incision with the horizontal bar of the H running anteroposteriorly, and about twice the length of the vertical arms. This can readily be enlarged in any direction if necessary. It is advised that the drainage be left in place from ten to twelve days and only the superficial dressings be left up to this time when the tissues acquire an added immunity and enough resilience to keep them from being torn open by the removal of drainage. The authors lay stress on the importance of laying these comatose patients on good beds provided with rubber rings or small air cushions. Scrupulous attention must be paid to their bodily cleanliness to avoid bed-sores. HARRY G. SLOAN.

**Payne, J. L.: War Injuries of the Jaws and Face.** *Lancet*, Lond., 1916, cxc, 569.

Fractures of the maxilla and mandible sustained in war differ from civil cases of jaw injury in the frequency of the occurrence of multiple fractures, comminution of bone, loss of substance, degree of displacement of fragments, the frequency of foreign bodies, and in the cicatrization of soft tissues, most trouble being associated with the mandible. Jaw injuries could be clinically classified into six groups: (1) fractures of the mandible without displacement of the line of occlusion; (2) single fractures with lateral displacement; (3) single fractures with vertical displacement; (4) two or more fractures of the mandible with loss of substance; (5) gunshot wounds of the maxilla; (6) fractures involving loss of the anterior portion of the mandible, the maxillæ, or the whole of one side, together with the adjacent soft tissue.

Co-operation between the general and the dental surgeon should eliminate unnecessary operations and the sacrifice of tissue which could have been saved. Restoration treatment may be considered under four heads: (1) reduction of displacement of bony fragments; (2) retention of these fragments in a position which allows of normal occlusion; (3) reduction of cicatricial contraction, restoration of muscular equilibrium, and the remodeling of facial tissues; (4) the fitting of a permanent prosthetic apparatus.

Union of the maxillæ did not present such difficul-

ties as that of the mandible, because of the better support and blood supply. In the absence of sepsis, union of the upper jaw usually occurs in a few weeks. The use of interdental splints does not necessarily tend to promote sepsis, as they are easy to keep clean. Efficient drainage is essential and thorough irrigation must be carried out from the start. To favor osseous union rest is important but absolute fixation is not necessary. Early attention to these cases saves loss of occlusion, such as has been the lot of too many patients.

E. K. ARMSTRONG.

**Reynolds, G. E.: Sinus Thrombosis in Compression.** *J. Am. M. Ass.*, 1916, lxvi, 952.

The author formerly believed that in cases of acute pressure on the surface of the brain of a non-septic and non-malignant nature, the patient would recover if the pressure was removed before the vital centers were on the verge of complete paralysis or the vasomotor center near to the end of its secondary depression and sepsis could be excluded. Two cases of fatal termination after meningeal hæmorrhage in which of the three main causes of thrombosis, viz., sepsis, vessel wall damage, and stasis, only the latter could be held accountable, has modified his opinion.

In the first case operation was not done for sixteen hours after the original injury. A very extensive clot was found in the temporal region, and death occurred one week later without the patient having regained consciousness. Thrombosis of the longitudinal sinus and the veins leading to it was the only cause found. In the second case operation after fourteen hours of unconsciousness revealed a large subarachnoid hæmorrhage. Necropsy the next day showed a firm thrombosis of the right lateral sinus, extending into the torcula and involving the straight sinus. In both instances the thrombosis was thought to be due to the prolonged pressure.

These cases are further evidence in favor of early decompression in well established cases irrespective of their cause or localization. Before surgery is employed an accurate diagnosis is essential, as the most profound hemiplegias may result from nothing worse than an angiospasm.

E. K. ARMSTRONG.

**Skinner, E. H.: Intracranial Aerocele.** *J. Am. M. Ass.*, 1916, lxvi, 954.

The patient had sustained a fracture of the right supra-orbital ridge of the skull with apparent recovery, but complained of dizziness and headache. Roentgen negatives showed a cavity containing air or gas and a comminuted fracture of the right frontal bone. The interpretation of the shadow as being subdural depended upon its round shape. Operation confirmed the roentgenoscopic diagnosis, and analysis of the collected gas showed it to be composed of oxygen, 1.8 per cent, nitrogen, 98.2 per cent, being practically air from which the oxygen had been removed by absorption. Twenty days



after operation the patient developed headache, temperature of  $104^{\circ}$ , and coma. Death occurred the next day, the necropsy showing leptomeningitis with a large amount of pus at the base of the brain.

E. K. ARMSTRONG.

**Duval, P.: Cranioplasty: Metallic, Cartilaginous, or by Bone-Plate** (Cranioplastie par plaque métallique, cartilagineuse, ou osseuse). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 611.

Duval has performed 18 cranioplastic operations, 9 of which were with aluminium plates, 1 bone-flap, and 8 cartilaginous reparations according to Mores-tin's method. In his early practice he used metal plates, but following Morestin's communications he used pieces of cartilage cut from the patient and he has now completely abandoned all other methods, owing to the excellent results he obtained from the use of cartilage.

W. A. BRENNAN.

**Quénu, E.: Extraction of a Projectile from the Brain; Use of the Bergonie Electro vibrator** (Extraction d'un éclat d'obus du cerveau; utilisation de l'électro-vibreur Bergonie). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 681.

The patient in this case was wounded in June, 1915. The head wounds were multiple. Two pieces of projectile were discharged by the mouth within a short time, but radiography disclosed a third piece in the left zygomatic region against the base of the brain. Owing to persistent symptoms he was operated upon in January, 1916. Exploration of the zygomatic fossa was negative, but a small rounded orifice was discovered at the cranial surface, and the Bergonie electrovibrator applied at this point gave very clear vibrations. The orifice was enlarged by trepan and the dura water exposed. On incising the latter the projectile was found embedded 2 or 3 cms. in the cerebral substance. It was extracted and the man has recovered completely.

W. A. BRENNAN.

**Throckmorton, T. B.: Cerebral Abscess, Probably Primarily Due to Suppurative Tonsillitis.** *Chicago M. Recorder*, 1916, xxxviii, 128.

The history is given of a man, 21 years of age, who complained of partial ankylosis of the jaw, ten months after an attack of tonsillar abscess. Fifteen months later he developed an abscess in the right temporal region which was drained, followed by a secondary operation to resect the necrosed zygomatic process, condyle, and neck of the mandible, at which time an area of bone was found anterior to and above the temporal articulatory surface entirely denuded of pericranial membrane. Following operation, the patient developed a gradually increasing right-sided exophthalmos and a small amount of pus was evacuated from the orbital cavity. He gradually developed symptoms of brain abscess without localizing symptoms and an exploratory incision evacuated a right temporal abscess with relief of symptoms for a time. The patient died a month later.

The author thinks the portal of entry for the organism causing the temporal abscess was through that portion of the skull anterior to and above the right temporomandibular joint, a spot made vulnerable by the loss of the pericranial membrane. At autopsy the dura and surrounding tissues at a point corresponding to the denuded portion of the bone showed marked inflammatory changes.

ELLEN J. PATTERSON.

**Goetsch, E.: The Influence of Pituitary Feeding upon Growth and Sexual Development.** *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 29.

The dried powdered pituitary extract, derived from both the anterior and posterior lobes of the gland, when fed to young rats in excessive doses (0.1 gm. daily), causes failure to gain in weight, loss of appetite, increased peristalsis, a mild enteritis, and certain nervous manifestations, such as muscular tremors and weakness of the hind limbs. The latter symptoms are undoubtedly due to the posterior-lobe element in the whole-gland extract, for they are similarly produced by using posterior-lobe, but not by using anterior-lobe extract. Even when whole gland is fed over a short period of time (from 25 to 40 days), it causes a more rapid growth and development and gain in weight, larger nipples in the female, and a coarser, drier, harsher growth of hair than is seen in either control animals or after similar administration of ovarian (corpus luteum) extract in equivalent dosage. In comparison with the development in control animals, the ovaries, tubes, and cornua of the uterus of animals fed with whole-gland extract are larger, more vascular, and oedematous in appearance, indicating increased development and activity. The testes show a considerably earlier growth and development; they are completely and permanently descended at an earlier age, and their gross weight is greater than in the control animal.

The feeding of pituitary anterior-lobe extract causes increased weight and greater and more vigorous body-growth and development over the control. There is similarly an earlier and more active genital development. The fur is harsher and thicker. Loss of weight, enteritis, and nervous manifestations are not observed as in the beginning of whole-gland feeding. As compared with the control, the animal fed with anterior lobe for only 40 days shows an earlier descent of the testes, which are also larger, more vascular and heavier, not only absolutely, but in proportion to the body-weight. The testis is mature at least as early as two and one-sixth months after 40 days of anterior-lobe feeding. The period of complete sexual development is shortened by at least one month, or about one-third of its normal time. Histologically, the testis at this age is mature; it shows an abnormally early and active karyokinesis, more active, in fact, than is seen in the testis of a normal rat at the age of from three to four months. The testis of the control at this same age is quite immature. The in-



terstitial cells do not seem to increase in number proportionately to the increase in spermatogenic cells and spermatozoa. The epididymis contains more spermatozoa and has a more active-looking structure. The prostatic gland, seminal vesicles, and vas deferens show a correspondingly early and increased development and activity. These changes produced by the feeding of anterior lobe indicate that the latter supplies the active principle in the whole gland responsible for the changes reported above, following the feeding of whole-gland extract.

After prolonged feeding of anterior-lobe extract, over a period of eight or nine months, the sexual instincts are early awakened, along with the early maturity of the sex glands. As a result of this, a pair of rats, after anterior-lobe feeding for a number of months, bred earlier and oftener, the female of this pair having two pregnancies in seven months, as compared with none in the female of the control pair. The effect of anterior-lobe feeding lasts throughout the adult life of the animal. The control rat never reaches the degree of development and activity shown by the animal receiving the anterior-lobe extract, for even at the age of ten months, after eight and one-half months of anterior-lobe feeding, the latter still shows a greater, more active, and mature sexual development than the control.

The feeding of pituitary anterior lobe to parent rats exerts its stimulating influence upon the offspring in intra-uterine life and during lactation, and, when the experiment is carried further and the feeding to the young is continued after weaning, it has an even greater stimulating effect upon growth, weight, and development, and causes earlier and more frequent breeding and an increased number of offspring in the litters. The stimulating effect upon the sex glands is greater, the longer the influence of anterior-lobe administration is exerted.

The extract of pituitary posterior lobe, even after prolonged administration, does not stimulate growth in general nor the development of the sex glands, as does anterior lobe even after a very short period. Thus, for example, there is a much less marked development of the sex glands after administration of posterior lobe for seven and one-half months than after anterior-lobe administration for two and one-half months. The posterior-lobe element in the whole-gland extract has an undoubted retarding influence upon the development of the sex glands, an effect very similar to that of ovarian extract upon the testes. This is shown by the relatively incomplete development of the testes, for example, after eight and one-half months of posterior-lobe feeding. If given in too large a dose, the extract causes loss of weight in the rats, a mild enteritis, and increased intestinal peristalsis.

Ovarian extract (corpus luteum), when fed to the male, especially, causes a tendency toward the deposition of fat, not only in the body generally, but in the testes and other glands as well, with a resultant marked increase in weight. The fur is heavier and coarser than in the animal fed with the

posterior-lobe extract. It does not cause an early descent of the testes. The latter are slightly heavier than those of the posterior-lobe-fed animal. This may be due, however, to an inhibiting effect exerted by the posterior-lobe extract rather than to any stimulating effect of the ovarian extract. The tendency to retardation of testicular development is, possibly, more definite after ovarian feeding than after posterior-lobe feeding. Corpus luteum, when fed to the female rat, is equally as stimulating as whole pituitary gland (active because of the anterior-lobe element which it contains), but not so stimulating as the equivalent weights of anterior lobe.

Following ovarian feeding there is, as compared with conditions in the control, increased development and activity of the female sex glands, increased follicle formation, a moderate increase in interstitial tissue, and increased branching of the fimbriated extremity of the tube. Prolonged ovarian feeding, e.g., for five to six months, to the male rat, as compared with the control, has the following effect: The gross size and weight of the testes, both absolutely and in proportion to the body development, is less and, histologically, the sex glands of the male show a retarded development and evidences of diminished activity. The definitely retarding influence of ovarian extract upon the male sexual development is exerted throughout the animal's life.

Briefly, then, pituitary extract (anterior lobe), when fed to young rats, has a stimulating effect upon the growth of the animal and upon its sexual development and activity. Posterior-lobe extract, when thus given, has a retarding influence. Ovarian extract (corpus luteum) has a stimulating influence upon the female and a retarding influence upon the male sexual development. EDWARD L. CORNELL.

#### NECK

**Plummer, W. W.: Cervical Ribs, Report of Seven Cases with One Operative Case.** *Am. J. Orth. Surg.*, 1916, xiv, 146.

The author reports a personal experience with seven cases. Cervical ribs have been observed as unilateral or double, usually related to the seventh cervical vertebra, and varying in completeness from a fully developed rib with articulations and muscle attachments down to a mere enlargement or overgrowth of the costal process of the vertebral unit. The commonest clinical evidence of the presence of the extra rib has been a neural disturbance in the arm associated with pain, or pain and varying degrees of paralysis referable to the distribution of the ulnar nerve, and suggesting pressure on or injury to the eighth cervical root. Less frequently disturbances in the circulation of the upper extremity, and spinal deviations have been observed. Apparently the size and shape of the rib do not bear any definite relation to the intensity of the symptoms produced. Many cases are discovered accidentally.

PHILIP LEWIN.



**Holding, A. F.: The Non-surgical Treatment of Tuberculous Glands.** *Med. Rec.*, 1916, lxxxix, 471.

Having observed the good effects of roentgen rays on tuberculous glands during the past fifteen years, Holding expresses surprise that the method is little known and seldom advised by the medical profession. He illustrates this by quotations from several recent writers.

Holding states that in caseous glands, or those that have begun to break down in the center, pus formation is hastened by the roentgenization so that the lesion rapidly increases in size. Unless forewarned the patient usually becomes frightened at this condition, thinking that the glands are being made worse by the treatment. They soon "point," and after an incision and evacuation of the pus these cases usually progress uninterruptedly to cures.

The best results from roentgen therapy are obtained in the advanced caseous lesions or those in which sinuses have formed; that is, in cases in which external drainage obtains.

In the early hyperplastic form of the disease, slower and less brilliant results follow X-ray treatment. Patients in whom the periphery of the lesion is ill-defined, cedematous, and actively advancing are much less favorable operative risks than when the glands have no periadenitis, are discrete, and not active. In these cases a tentative course of X-ray treatment is advisable even if subsequent operation is contemplated. This will reduce the activity of the process, stop peripheral extension, and reduce the lesion in size, and it can be removed surgically if time is a factor. If surgical removal is to be done after the active process has been controlled by roentgen therapy the operation should be performed before sufficient time has elapsed to allow post-roentgen fibrosis to develop.

Seventy cases of tuberculous glands treated by Holding were classified, according to Blaisch, as follows: (1) hyperplastic type, 16; (2) caseous or purulent type, 24; (3) ulcerated or fistulous type, 30.

In the first class 3 became symptomatically well; 2 were improved and relapsed later and were symptomatically cured by a second course of treatment; 5 disappeared from observation; 5 were improved and later submitted to an operation; 1 was unimproved.

In the second class 19 became symptomatically well; 2 disappeared from observation; 3 were improved.

In the third class 25 became symptomatically well; 5 disappeared from observation.

The essentials of deep roentgen therapy are the use of the Coolidge tube, high voltage, measured maximum skin dosage, crossfiring, and filtration of the rays, given in three to ten series of treatments. If the dose to each skin area is limited to 15X (Kienboeck), no disagreeable skin symptoms will follow.

The conclusions are:

1. The efficacy of X-ray treatment in tuberculous

adenitis has been demonstrated, over 1,500 successful cases having been reported.

2. The surgical treatment which was orthodox before the discovery of the X-rays and their therapeutic value is still advised by many members of the medical profession.

3. Non-surgical methods, including the X-rays, deep hyperæmia, and tuberculin, should be tried before any case is submitted to radical operation.

DAVID R. BOWEN.

**Reder, G. J.: Cerebral Nerve Disturbances in Exophthalmic Goiter.** *Am. J. M. Sc.*, 1916, cli, 339.

The author calls attention to the cerebral nerve palsies which occur in exophthalmic goiter as rare manifestations of the disease. Not more than 80 cases in all are recorded, there being only 4 cases reported in American literature. The case reported is the first instance which has come under observation in the Johns Hopkins Hospital.

The patient was a Russian Jew, aged 23 years. A year after the appearance of the goiter (1910) the patient became aware of a droop of the right upper lid; a similar condition of the left lid soon followed. This bilateral ptosis gradually became more marked. Soon after the appearance of the ptosis the patient was troubled with double vision, which persisted. About five weeks before admission, owing to loss in the power of mastication he was unable to chew solid food. For a month he had had difficulty in speech, jumbled his words and talked through his nose. A week before admission he lost his voice completely for a period of three days. For the same period his tongue felt thick. He had difficulty in swallowing, and fluids taken by mouth were repeatedly regurgitated through the nose. Great weakness of the upper and lower limbs compelled the patient to give up work.

A striking feature on examination was the patient's facial appearance: drooping lids, protruding fixed eyes, mask-like face, open mouth, and hanging jaw. He was extremely weak and suffered from marked dyspnoea. Unable to expel mucus which collected in his throat he had frequent violent paroxysms of coughing. His voice had a nasal quality. He was clear mentally, but emotional. Exophthalmos was extreme. The thyroid was much enlarged. There was complete bilateral ptosis and fixation of the globes. The pulse was about 120 per minute and there was well-marked tremor of the fingers. The hands and feet were perspiring. Pigmentation was pronounced. Nausea, vomiting, and a rather persistent diarrhoea were complained of during his illness. The blood count showed white cells 9,000; polymorphonuclears, 71 per cent.

Double vision was constant. Movements of the head from side to side had no influence on the position of the eyeballs. There was complete ophthalmoplegia externa, a complete paralysis of the third, fourth, and fifth cerebral nerves. The fifth motor

seemed markedly involved. Facial weakness was manifest on both sides.

Ligation of the superior thyroid arteries was performed. Death occurred on the second day, due apparently to acute respiratory paralysis.

The literature on cerebral nerve disturbances in exophthalmic goiter is summarized by Heuer, who calls attention to a comprehensive article by Sattler and Kappis published in 1911. Reported cases show that the oculomotor nerve has been most frequently affected. Single muscles or all the muscles supplied by this nerve have been involved. Kappis collected over 40 cases in which the eye muscles alone were affected. Isolated palsies may occur, but combinations of various kinds are most commonly seen. A pure ophthalmoplegia externa has been observed in 6 cases. Isolated palsy of the fifth motor has not been observed; combined, this nerve has been affected five times, chiefly in cases of bulbar paralysis.

With the exception of palsy of the facial, 5 cases of which have been reported, isolated palsies of the remaining cerebral nerves are extremely rare. Combined palsies of these nerves are not uncommon, and the most varied clinical pictures occur. The spinal accessory appears to be the only cranial nerve which has escaped involvement in exophthalmic goiter.

The cases with bulbar paralysis have all been severe cases of exophthalmic goiter, and in most instances the disease has run a rapid course. Death has invariably followed the appearance of these symptoms, and in the majority of instances within a short time.

As regards the etiology of nerve palsies in exophthalmic goiter, it is assumed that the disturbances are of a toxic nature.

Comparatively few pathological lesions in the brain have been recorded in the cases of exophthalmic goiter with nerve palsies, though in 4 of the 6 cases with bulbar paralysis in which autopsies were obtained, definite lesions were present in the medulla associated with extensive degeneration of fiber tracts.

The palsies may appear at any stage of the disease. In most cases they manifest themselves months or even years after the onset of the disease. They may begin insidiously or quite suddenly. In no case has the palsy been benefited by operation, although marked improvement in other symptoms has been noted. There are 2 cases, however, in which palsies of short duration have disappeared without operation on improvement of the other symptoms, and 3 cases in which there was a partial recovery of the palsies.

In the differential diagnosis, myasthenia gravis, which is at times associated with exophthalmic goiter may cause uncertainty as to diagnosis. Sattler reports 6 cases in which a positive myasthenic reaction was obtained, with variation from day to day in the palsies. Brain tumor, cerebral hemorrhage, multiple neuritis, and multiple sclerosis

have all been observed associated with exophthalmic goiter and might also give rise to some difficulty in diagnosis.

E. H. POOL.

**Swan, J. M.: Observations on the Blood-Pressure in Cases of Dysthyroidism.** *Interst. M. J.*, 1916, xxiii, 186.

Swan gives an account of blood-pressure observations made in 50 cases of dysthyroidism in varying degrees of intensity. The cases were analyzed with regard to systolic, diastolic, and pulse pressures, as well as to the functional capacity of the heart. Riva-Rocci and Tycos instruments were used with a twelve-inch cuff. The author adopted Woley's figures as normal for the different ages. Systolic pressure for persons between 15 and 30 years of age was 122, between 30 and 40, 127, and from 40 to 50, 132 mm.

The author divided his series into three classes. Of the 50 cases, 21 had a normal blood-pressure for their age; 15 had a low pressure; and 14 had a high blood-pressure. Detailed charts were given, covering the various observations and their time intervals. Several blood-pressure charts, taken during operation for thyroidectomy, were also given.

The following conclusions were drawn: (1) The effect of thyroidism on the blood-pressure is to lower the systolic; this is accompanied by an increase in the pulse pressure. (2) After the case has persisted for a varying period, and after the development of cardiac hypertrophy and vascular changes, the cases are converted into typical examples of chronic hypertension. (3) The myocardium is disturbed in nearly all cases, whether there is clinical evidence of such disturbance or not.

HARRY G. SLOAN.

**Kendall, E. C.: The Function of the Thyroid-parathyroid Apparatus.** *J. Am. M. Ass.*, 1916, lxxvi, 811.

No complete hypothesis can be formulated at this time when many other factors remain so obscure, but the process occurring in the normal animal may be outlined as follows: The body proteins are decomposed to a slight extent into amino acids. These, under proper conditions and in the presence of the iodine compound, are deaminized and the products of this reaction are then burned either directly into carbon dioxide and water or are used for the formation of carbohydrates, fats, etc. If, for any cause, an increase in the amount of the iodine compound in the cell is brought about, the speed at which this reaction takes place is increased, the equilibrium between proteins and amino acids is disturbed, more amino acids pass into the reaction, and ultimately the proteins, unless replenished, are exhausted. At the same time the products of the reaction, deaminized acids, are formed in increased amount. This results in an increased speed of the processes of oxidation and the formation of carbohydrates and fats. The



delicately balanced relations between proteins, carbohydrates, fats, and oxidation are, therefore, affected at a vital point since the equilibrium of the entire body is changed and the speed of reaction of all body functions is increased.

The presence of the deaminizing catalyzer does not affect the mechanism of the formation of body proteins from foreign proteins, or the decom-

position of body proteins into amino acids. There is no direct change in the mechanism entering into the metabolism of carbohydrate and fat formation and oxidation. The only thing which is influenced is the rate at which deamination occurs. If this hypothesis be correct, evidently the function of the thyroid is to furnish a catalyzer which regulates the rate of deamination.

EDWARD L. CORNELL.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Sekiguchi, S.: Hypophyseal Disorder in Mammary Cancer and Its Relation to Diabetes Insipidus.** *Ann. Surg., Phila.*, 1916, lxiii, 297.

Diabetes insipidus has been divided into the symptomatic, due to some organic brain disease, as irritation of the medulla, pons, or cerebellum, and the idiopathic which occurs without any pathological findings and without any accompanying clinical symptoms. The latter is not to be confused with hysteropsychopathic polyuria or that provoked by some emotional stress, but is probably a disordered kidney function.

Certain diseases of the hypophysis, such as acromegaly and adiposogenital dystrophia are often accompanied by diabetes insipidus. Simmonds has published the opinion that diabetes insipidus occurring in patients with carcinoma of the breast was caused by metastasis into the hypophysis. On account of Simmonds' work, the author investigated 35 hypophyses in cases of mammary cancer coming to autopsy. In two of these cases polyuria appeared in the late stage of the disease with no evidence of renal disorders. In each instance cancer metastasis in the posterior lobe of the hypophysis was found, with no pathological changes in the gray matter of the third ventricle. These cases are well explained according to the theory of Schaefer, as it seems quite likely that the tumor in the pars posterior compressed the pars intermedia sufficiently to develop a hypersecretory function. This increased secretion in turn stimulated the epithelium of the kidneys to the overproduction of urine.

GATEWOOD.

**Hoxie, G. H.: Thymic Disturbances in the Adult.** *N. Y. M. J.*, 1916, ciii, 676.

The author reports a case of enlarged thymus, in which the chief complaint was weakness and difficulty in breathing. Fluoroscopic examination showed a dark area beneath the upper part of the sternum. The symptoms gradually improved under thyroid and arsenic administration. The condition, however, was not relieved, for periodically the patient returned until finally an operation was performed.

The first and second costal cartilages were resected, together with a portion of the manubrium.

A glandular mass was found three-fourths of an inch long and three-eighths of an inch in diameter. It was removed and had the appearance of a persistent thymus. The patient recovered completely.

Several other cases are reported by the author in which improvement followed the administration of products of glands of internal secretion. Many of these cases had been diagnosed as neurasthenia or hysteria.

J. H. SKILES.

### TRACHEA AND LUNGS

**Dunham, K.: Roentgenographic Diagnosis of Pulmonary Tuberculosis.** *Am. J. Roentgenol.*, 1916, iii, 131.

Dunham reports his findings from serial microscopic section of blocks from lungs previously examined by the stereoscopic roentgen method, calls attention to findings previously reported, and reaches the following conclusions:

1. In the X-ray we have an excellent means of studying the fundamental principles of pathology. It accurately indicates abnormal density, and when we learn where these densities are located and to what they are due we may solve many pathological problems. When our ideas of pathological conditions will not explain the X-ray findings we have presented a valuable field for research.

2. The X-ray will often provide the first definite knowledge of the existence of tuberculosis, but a diagnosis of tuberculosis is not of great value unless it can be accompanied with a fairly accurate prognosis, and nothing has ever been of such prognostic value as the roentgen findings, unless it be the physical condition of the patient.

Three conditions argue for a bad prognosis: cavity, involvement of the bases if at all extensive, and laryngeal tuberculosis. Two of these are best determined by means of the roentgen ray.

DAVID R. BOWEN.

**Rist and Holland: Pulmonary Gangrene of Otitic Origin** (*Gangrène pulmonaire d'origine otitique*). *Presse méd.*, 1916, p. 149.

The patient whose case is reported by the authors arrived at the hospital in a grave condition with fever, thoracic pains, dyspnoea, etc. Central pneumonia was suspected. At the same time there was found a running from the ear which the

patient said had lasted several weeks. After three or four days there was a zone of inflammation at the base of the left lung and the expectoration became foetid. The general state became aggravated and the patient died.

At autopsy a large number of disseminated, embolic, gangrenous foci were found in both lungs, in different stages of evolution. The origin of this pulmonary gangrene was sought in the ear; an old middle-ear otitis was found, also a mastoiditis with obliteration of the cells, and an obliterating phlebitis of the lateral sinus and of the internal jugular. The meninges were not attacked.

These pulmonary complications of chronic otitis, frequent in children, are very rarely met with in adults. Like all other suppurative complications of chronic otitis they have a foetid, putrid, and gangrenous character, and their gravity is such as to call for early treatment by a specialist.

W. A. BRENNAN.

**Villeon, P. de la: Operative Extraction of Intrapulmonary Projectiles both Deep and Superficial, Under the (Radioscopic) Screen, by a Simple, Rapid, and Sure Process** (*L'extraction opératoire des projectiles intrapulmonaires, superficiels et profonds, sous l'écran par un procédé simple, rapide, et sûr*). *Bull. Acad. de méd., Par.*, 1916, lxxv, 1916.

In the great majority of cases the operation of thoracopneumotomy for the extraction of intrapulmonary projectiles may be replaced by a simpler procedure which the author has devised and describes in detail. After locating the foreign body the patient is placed under the screen, a buttonhole incision is made over the location through which a closed extracting forceps is introduced; and, under the guidance of the radioscopic projection, pushed through an oblique trajectory until it reaches the body. The forceps is then opened, the body seized and extracted. There is neither pneumothorax nor hæmothorax. The author has extracted 17 intrapulmonary projectiles by this procedure, of which 8 were deep. He has also extracted 20 intrapleural projectiles and several of his colleagues have successfully employed the method. Thoracopneumotomy is now only exceptionally done. W. A. BRENNAN.

**Georg, C., Jr.: Some Experiments in Lung Surgery.** *J. Mich. St. M. Soc.*, 1916, xv, 135.

Georg reports 18 resections of the lung performed experimentally on dogs. These operations were performed with Meltzer's insufflation apparatus with the idea of determining the dangers which may accompany this method of anæsthesia. The article is illustrated with three photographs of dogs which recovered from the operation and two photographs of their lungs which were removed after killing the animals with ether two to six months after operation. Pathologic sections of the lungs were made in all cases by Dr. A. S. Warthin.

The author gives a historical review of the most important experimental work which has been done

upon the use of both positive and negative pressure in the surgery of the lungs. In general the results have been much better following the use of negative pressure than positive, because the former produces conditions more closely resembling the physiological. Thus Cloetta (1910-1913) showed, by means of a special lung plethysmograph in which he placed the lungs and stopped the respiratory movements by means of curare, that if the lung is distended to exactly the same degree by positive and negative pressure one third less pressure is required with the negative than with the positive, or if the same amount of pressure is used in each case the lung will be more distended with negative pressure. Georg's experiments show that a slight degree of positive pressure is not dangerous, but if the pressure is too high or too low it may result in serious reflex disturbances in the lungs and deleterious effects upon the circulation, depending upon the reserve power of the right ventricle.

All animal experiments seem to show that total extirpation of one lung has a higher mortality with positive pressure than with negative, because the pressure of air in the empty pleural cavity which cannot be entirely driven out prevents the collapse of the chest wall and changes in the position of the diaphragm, mediastinum, and sound lung which is necessary for recovery.

Resection of the lung is a very dangerous operation both on dogs and on the human on account of the risk of pneumothorax and the difficulty of making a hermetic closure of the bronchus and lung. Infection may occur from the external wound or from the presence of germs in the nose and throat which are driven into the bronchi and lungs by the insufflation apparatus. The author's experiments show that this is true of operations upon dogs which are often affected with distemper.

When lung resections are done under positive pressure an exudate usually forms in the pleural cavity. This the author found to be true but Kawamura found no exudate after his operations.

Dogs are especially unfavorable subjects for lung operations on account of the shock which results from exposure and loss of body temperature, their inability to stand pneumothorax well, and their low resistance to infection in the pleural cavity.

The exudate which forms after a thoracotomy causes compression of the lung, which has a bad effect upon the circulation and function. Georg proved that secondary infection of the compressed lung may result in the formation of areas of pneumonia. In the case of wounds of the lung in man, pneumothorax may be prevented by the use of Tiegel's drain. The anatomy of the dog accounts for its low resistance to pneumothorax. The thorax in man offers considerable resistance to pneumothorax as in only about 5 per cent of intrathoracic operations does it become necessary to use any apparatus to prevent pneumothorax.

In the dog these conditions are different as the animal will die in a few minutes if a wide opening is



made in the chest without the use of differential pressure. This is due to the fact that its mediastinum is so loose and delicate that it flutters up into the wound and often becomes perforated, thus allowing air to get into the sound half of the thorax resulting in double pneumothorax.

A series of pneumectomies were performed upon dogs at the surgical laboratory of the University of Michigan, Meltzer's apparatus for intratracheal insufflation being used. These operations were all done under aseptic conditions. The author draws the following conclusions from the results of these experiments: Intratracheal insufflation was not without harmful effects upon the lungs even in those dogs that recovered. Interstitial emphysema and overdistention of some of the alveoli of the lung were shown microscopically. These changes

were much more marked in the animals that died than in those that recovered and consisted of large hæmorrhagic areas with tearing of the walls of the alveoli. Insufflation also has a very harmful effect upon the circulation in the lungs as is shown by the intense congestion and atelectasis found microscopically.

The transplantation of a strip of fascia lata upon a wound in the lung gives an added protection to it from infection. Preliminary ligation of the bronchi and careful suture of the lung tissue must always be done. After the suturing is complete, careful search must be made for the escape of air from the lung wound by moistening it with salt solution. For intratracheal insufflation a No. 18 to 24 French catheter should be used and the pressure should be maintained at 20 to 25 millimeters of mercury.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Rouvillois, H., and others: Clinical and Therapeutic Study of Abdominal Wounds in War Surgery** (*Etude clinique et thérapeutique sur les plaies de l'abdomen en guerre*). *Bull. et mèm. Soc. de chir. de Par.*, 1916, xlii, 708.

Owing to the importance of the subject and the many and diverse opinions expressed by surgeons on the treatment of abdominal injuries the authors have made a thorough and detailed study of the entire question and their exhaustive report occupies the greater part of the present issue of the bulletin of the Society of Surgery. In the early part of the war the authors like others labored under the disadvantage that the conditions at the front offered to the systematic practice of abdominal surgery; but later the ambulance service was provided with all the necessary equipment for successful intervention. The authors were situated about 18 kilos from the first line of trenches and hence the wounded did not generally reach them for an interval of from six to seven hours after injury.

Altogether they observed 247 abdominal wounds, which they divide into: (1) extraperitoneal wounds—parietal or visceral; (2) peritoneal wounds—simple or visceral; and (3) thoraco-abdominal wounds. In all 133 cases are reported in detail under these headings.

Extraperitoneal injuries, parietal or visceral, do not as a rule present very difficult problems, but with peritoneal wounds where the serous or an intra-abdominal organ is involved the outcome is more doubtful. In 74 laparotomies for peritoneal injuries a very abundant hæmatocele was observed in 38, and in only 2 of these were lesions of the large intra-abdominal vessels demonstrated. Of the 40 cases which were laparotomized immediately for univisceral wounds, 23 were of the small intestine, 8 of the large intestine, 9 of the liver, spleen,

etc. Of the 21 cases of multivisceral wounds which were laparotomized, 10 were in the small intestine and colon.

During the winter of 1914, owing to the lack of facilities, it was found necessary to perform 28 Murphy operations. The results from these led to the conclusion that the method had no therapeutic value. Of the 28, 5 recovered, but the authors are of the opinion that these cases would have recovered without intervention. They believe that laparotomy with immediate repair of the lesions is the only logical and acceptable procedure, and they have confined themselves to this practice for the past eight months.

The results of their observations are as follows:

**Abstention.** The mortality of 67 non-operated peritoneal wounds was 80.5 per cent. Strictly speaking these cases could be reduced to 61 in which deliberate medical treatment was adopted and the mortality in these cases was 100 per cent.

**Murphy operation,** 28 cases, mortality 82.1 per cent.

**Laparotomy,** 74 cases, global mortality of 73 per cent.

Of the laparotomies, 5 were exploratory. Of the other 69, 64 were for peritoneal wounds and 5 for thoraco-abdominal wounds. Analysis of the figures shows: for simple peritoneal wounds, mortality, nil; for visceral peritoneal wounds, mortality, 80.3 per cent.

Again subdividing the results into univisceral and multivisceral injuries, the mortality for the former is 75 per cent and for the latter 90.5 per cent.

Regarding the nature of the projectiles causing the injuries the authors were able to identify them in 86 cases: 23 injuries were from bullets, with a mortality of 52 per cent, and 63 were shell or grenade injuries, with a mortality of 73 per cent. The mortality from the standpoint of the time elapsing between

the period of injury and that of operation was as follows: operated upon during the first six hours, 84.8 per cent; operated upon between seventh and twelfth hours, 80 per cent; operated upon between thirteenth and twenty-fourth hours, 83 per cent; operated upon after twenty-four hours, 66.6 per cent.

The authors' conclusions are that abdominal wounds in war, as in peace, are amenable to immediate surgical treatment. The contra-operative indications are not confined to war conditions; they are those indicated by general surgical practice.

The authors rather disapprove of treatment of abdominal injuries in shelters close to the firing line because they are too much exposed to shell fire and explosions. They think that surgical ambulances situated about 12 kilos from the firing line best answer all purposes, these being in constant automobile connection with the front. The inconveniences of transport are fully compensated for by the added surgical comfort and the greater facilities for the necessary post-operative care.

W. A. BRENNAN.

**Huertas, J.: Some Observations on Abdominal Wounds and Their Treatment** (Algunas consideraciones sobre las heridas del abdomen y su tratamiento). *Rep. med. y cir.*, Bogota, 1916, vii, 256.

The author considers that in cases of severe abdominal penetrating wounds with extreme collapse where other means of intervention are not applicable or contra-indicated, the Murphy drainage method is the only one suitable. Surgical intervention was resorted to in 15 cases of perforating wounds. The abdomen was incised and suprapubic drainage with an inclined posture of the patient instituted, according to Murphy's method, and three cures were obtained, the mortality rate being 80 per cent. On account of this high mortality, the author decided to perform laparatomies, observing systematically all visceral lesions in each and every patient, the results being a cure in five cases, a mortality rate of 55 per cent.

Total abstinence from surgical interference is practicable in cases of wounds of 2 or 3 days' duration, and the patient's condition is satisfactory; or in cases of precocious collapse where no other intervention is desirable or indicated except the reanimation of the patient.

A median laparotomy is considered the most practical and ether anaesthesia the safest.

RAOUL L. VIORAN.

**Piqué, R.: Evolution of the Treatment of Abdominal Wounds in an Ambulance at the Front** (Evolution du traitement des blessures de l'abdomen dans une ambulance de l'avant). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 545.

Piqué points out the almost marvelous results from early surgical intervention in the field in the case of even severe abdominal penetrating visceral injuries.

Analyzing the available figures he finds that abstention gave a recovery of 6 per cent; 14 palliative operations gave no recovery; laparotomy in general gave about 40 per cent of recoveries.

Piqué states that the global statistics of the war show the rarity of spontaneous recovery, the uselessness of palliative operations, and the absolute innocuity of laparotomy.

The results show that abdominal wounds are no longer beyond the resources of surgery when the injured are treated early in the surgical ambulances near the firing line.

With the means now available all operable abdominal wounds should receive prompt operative treatment. By operable wounds he means all those arriving at the ambulance before the sixth hour after injury, sometimes even within ten hours; those who have not multiple serious wounds; those who are not in a state of shock or extreme anæmia, or with generalized peritonitis; finally, those who have no large abdominal evisceration. W. A. BRENNAN.

**Chevassu, M.: Study of 210 Abdominal Wounds Observed During 15 Days in an Automobile Surgical Ambulance; the Favorable Results of Abstention** (Étude sur 210 cas de plaies de l'abdomen observées en 15 jours dans une ambulance chirurgicale automobile; et en particulier sur les résultats heureux des méthodes abstentionnistes). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 646.

Chevassu presents a long and important report on the treatment of penetrating abdominal wounds in war.

In the early part of the war it was seen that three factors were essential for successful treatment of abdominal wounds at the front: rapid evacuation, materials, and experienced surgeons. When there was no efficient surgical installation abstention gave better results than intervention.

Now there are fixed installations placed quite at the front, fully equipped and well protected; moreover there is an automobile service equipped with experienced surgeons, and early intervention is assured in either the advanced post or the automobile. The operative results are much better and therefore intervention is a matter of choice. Still the general mortality is very high, and Chevassu thinks that if intervention cannot be made under conditions which promise success, abstention is advisable.

In the discussion of results only intraperitoneal wounds are regarded as abdominal wounds.

Of 210 abdominal wounds observed, 136 were peritoneal, of which 57 died and 79 were evacuated, a mortality of 41.91 per cent. Of the 57 deaths, 27 or 47.36 per cent, had been operated upon; 27 were not operated upon; 3 were late operations.

These results are very different from the 92 per cent mortality in the cases reported by Caudrelier and Stern which could not be operated upon.

Of the 57 deaths, 20 occurred in the first 24 hours, and of these 8 had been operated upon, some dying



during the operation or immediately afterward of shock.

Of the 79 treated by evacuation, 66 did not undergo any intervention, 13 were operated upon.

Of the 136 injuries that were stated to be peritoneal, there is no question of this as regards 100 which were clinically established. Of these 100 cases of established penetrations, 53 died—53 per cent—15 deaths being immediate, neither intervention nor abstinence being responsible. The 85 valid cases therefore show a mortality of 44.7 per cent; and in the 36 cases where the lesion of a viscera is only probable the mortality is 11.11 per cent.

The consideration of these results has converted Chevassu from being, as he was at first, an abstentionist by necessity into being an abstentionist by choice.

Tuffier who presented this report on behalf of the author is not convinced that abstinence is the better policy. In position warfare where the surgeon is well equipped and ably seconded he would not oppose laparotomy which, when the patient's condition and the organization permits it, offers a much better prognosis.

While as a rule wounds of the liver and stomach are less formidable than other penetrations and may in certain cases benefit by a policy of abstinence, unfortunately there is no sign by which the exact conditions can be judged, and laparotomy alone under suitable conditions allows the making of a precise diagnosis and prevention of peritoneal infective complications.

W. A. BRENNAN.

### GASTRO-INTESTINAL TRACT

**Andresen, A. F. R.:** Infections of the Mouth, Nose, and Throat, as Primary Foci for Infections in the Gastro-Intestinal Tract. *Long Island M. J.*, 1916, x, 102.

It has been extremely interesting to note the almost invariable presence of infective foci in cases of gastro-intestinal infections. These foci, with a few exceptions in cases where they were located in the skin (boils or erysipelas), rectum (ischio-rectal abscess), or pelvis (post-partum or post-abortion infections), were usually found in the mouth, nose, or throat. The following table shows the relative frequency of these different focal infections in a series of gastro-intestinal cases observed in the Brooklyn Hospital Dispensary. Infections of turbinates, sinuses, posterior nasal fossa, tonsils, etc., have been grouped under the heading of nose and throat infections, and all cases of infections of teeth and gums, past or present, under the heading of pyorrhœa. Nearly all cases of infections of the nose and throat had a pyorrhœa also present, but not all cases of pyorrhœa showed infections of the nose and throat. This raises the question whether pyorrhœa may not be an etiological factor in many of these infections of the nose and throat, and explains why treatment of the latter conditions is unsuccessful if the teeth are not attended to.

Disease	Total Cases	Pyorrhœa	Nose and Throat Infections	Pelvic Infections	Skin Infections
Gastric Ulcer.....	64	57	0	..	1
Appendicitis.....	41	26	3	11	1
Gall-bladder disease.....	18	17	..	1	..
Diabetes.....	5	5	..	..	..
Gastric carcinoma.....	8	8	..	..	..
Total.....	136	113	9	12	2
Per cent.....		83	6	10	1

The conclusions to be derived from a study of the facts presented are as follows:

1. The importance of infections of the mouth, nose, and throat in the etiology of infections of the gastro-intestinal tract has been definitely established.

2. The treatment of infective lesions of the gastro-intestinal tract must be modified to take cognizance of this newer knowledge and should include the following:

(a) The use of autogenous vaccines made from infective material obtained from any accessible foci of infection.

(b) Removal of infective foci as early as possible, preferably before the institution of any other line of treatment.

(c) Adequate medical treatment, including diet, hygiene, and the correction of errors in posture and other deformities.

(d) Suitable operation wherever indicated.

3. As a prophylactic measure, prompt attention should be paid to all mouth, nose, and throat infections as soon as they are discovered.

EDWARD L. CORNELL.

**Soresi, A. L.:** Perforations of the Various Abdominal Organs; a Clinico-experimental Study to Determine When and Where There Should Be Surgical Intervention (Perforazione dei vari organi addominali; studio clinico-sperimentale per stabilire se e quando si debba intervenire chirurgicamente). *Gior. d. r. Accad. di med. di Torino*, 1915, lxxviii, 390.

Soresi of New York, who is now serving on the surgical staff of the Italian army at Turin, states that it is the general opinion of surgeons that where there is a manifest perforation of the stomach or intestine operation must always be made. To determine whether in such a perforation, due either to traumatism or disease, there are conditions which might render surgical interference dangerous, a large number of experiments in dogs were made. These were divided into four classes:

1. Animals which after perforation of the stomach or intestine had been made were left to themselves.

2. Animals which were operated upon three hours after perforation of the stomach or intestine.

3. Animals operated upon 24 hours after perforation.

4. Animals operated upon 48 hours after perforation.

Altogether 240 dogs were experimented on: 80 for stomach perforations, and the others for various portions of the intestinal tract.

The experimental results demonstrated these facts:

1. All perforations in the region of the ileum and the cæcal cul-de-sac recover spontaneously when not operated upon.

2. Wounds of the stomach may recover spontaneously.

3. Duodenal and colonic perforations are always fatal when left to themselves; i.e., when not operated upon.

4. All wounds of the stomach, duodenum, ileum, cæcal cul-de-sac, and colon are cured if operated upon 3 hours after injury.

5. The mortality increases in all cases as the time between the injury and intervention increases.

6. In perforations in the region of the ileum and the cæcal cul-de-sac there was no mortality if the animals were not operated upon or were operated upon 3 hours after perforation; but there were fatal results when the animals were operated upon 24 hours after perforation, and the mortality increased when the time of operation was extended up to 48 hours.

The practical conclusion which the author draws from his experimental results is that, owing to the probability of spontaneous recovery in perforations of the gastro-intestinal tracts, and that the technical difficulties of surgical intervention require a very skillful surgeon and intelligent assistants, intervention should be avoided, except when it is certain that the perforation involves the colon or duodenum, in which event it must be made as it offers the only chance to save the patient's life.

W. A. BRENNAN.

**Smithies, F.: The Etiologic Relationship Existing Between Gastric Ulcer and Gastric Cancer; an Analysis of 921 Cases of Gastric Cancer and 500 Cases of Gastric Ulcer.** *Lancet-Clin.*, 1916, cxv, 203.

The author discusses the etiologic relationship deduced from the comparative study of 921 cases of operatively-proved gastric cancer with 500 operatively demonstrated cases of benign gastric ulcer.

Experimentally gastric ulcer has been produced by bacterial activity as well as by their toxins, also by cutaneous burns, poisons of metabolic origin, corrosive poison, as well as by alterations in the circulation of the stomach. The life history of any gastric ulcer cannot be predicted. Most of them have a tendency to spontaneous healing, as is shown by the finding of healed scars at the autopsy table or at operation. The time for the development of ulcer is not definitely determined, and while huge calloused ulcers may form in a few weeks, the superficial erosions may exist for years. No experimental method has ever been devised that causes gastric ulcer in an animal to become malignant. Thus in the human there is still some unknown factor at work. Of the gastric cancer cases 65 per cent were preceded by dyspeptic symptoms, apparently of the benign type as seen in ulcer, so closely simulating them that differentia-

tion was impossible. McCarthy's account of 280 resected gastric ulcers is quoted, in which clinically there was no hint of malignancy, yet 63 per cent of these cases showed evidences of a typical cell at their edges. Still this does not prove that these ulcers were ever benign. In quoting the general opinions in regard to the percentage of gastric cancer preceded by ulcer, the figures vary from Fenwick's 3 per cent to Sapeska's 90 per cent. Duodenal ulcer occurs in the proportion of 2.45 to 1 of gastric ulcer, yet cancer of the duodenum is of very infrequent occurrence. Whether this relation is influenced by the different chemical reactions of the intestinal juices, or by the more rapid progress of the food through the duodenum, it is impossible to say. The duodenum seems to have some inherent protective mechanism against malignancy, however. Cancer of the stomach rarely involves the duodenum by extension; whereas ulcer of the duodenum extending through the pylorus not infrequently shows malignant changes on the gastric side. Apparently gastro-enterostomy, in case of gastric cancer, has a tendency to prolong the disease and lessen its virulence. Evidence strongly supporting the pathologic proof that malignancy may develop in gastric ulcers, is furnished by the histologic observations of all degrees of hyperplasia, benign, intermediate, and malignant, in sections, through different points of excised ulcers. Gastric ulcer usually causes death within a year of the onset of symptoms, unless there is surgical intervention. This varies, however, as one individual may be overcome in a few weeks, while another may live for several years.

Smithies divides his cancer cases into two groups: (1) those in which there was chronic dyspeptic disturbance, clinically benign, followed by an ailment which appeared clinically malignant from its start: (2) cases in which the disease was continuous and progressively downward, clinically malignant, with no previous gastric trouble. The first group shows the possibility of separating clinically the benign from the malignant. The proportion was 56.4 per cent in group one; 39.1 per cent in group two. Cases in group two were clinically malignant from the start, the average duration of symptoms being 7.6 months. These cases may have resulted from cases previously benign, unnoticed. The location in the stomach of cancers and ulcers, practically identical, is quite suggestive of the relationship of their origin. Neither clinically, microscopically, nor experimentally, is it possible to prove that cancer arises from ulcer. However, from various correlated standpoints, their coexistence is very suggestive of ulcer shading off into cancer.

H. G. SLOAN.

**Durante, L.: The Trophic Element in the Origin of Gastric Ulcer.** *Surg., Gynec. & Obst.*, 1916, xxii, 399.

The methods by which gastric ulcers have been produced experimentally are reviewed. Durante



states that in order to obtain a clean experiment a disturbance of secretion, circulation, or innervation must be created. (1) The pathogenic value of a gastric juice is not clear. Hydrochloric acid by mouth and hypotonic salt solution have both given negative results. (2) Obstruction of the larger gastric arteries has failed, but emboli blocking the smaller vessels has given satisfactory results. Ulcers thus produced are replicas of acute ulcers in man and heal readily. (3) The sympathetic nerve controls the vasomotor nerves of the stomach, and it is also the trophic nerve.

Dalla Vedova gives the only description of artificial ulcers presenting features of chronicity produced by disturbed innervation. His experiments are made through transperitoneal operation and are open to criticism. Durante, in order to defend his experiments, chose the lumbar route in operating. The results are as follows: (1) No lesion results after resection of the major splanchnic. (2) Resection or ligation of the median splanchnic invariably caused hæmorrhagic and non-hæmorrhagic lesion. (3) Resection of the minor splanchnic occasionally produced a slight hæmorrhagic lesion. (4) Resection of the median and minor splanchnics caused lesions. (5) Resection of the three splanchnics produced lesions. (6) In resection or ligation of the median splanchnic, hæmorrhage and intense congestion were seen in the adrenal of the corresponding side, but these changes did not occur when the major splanchnic alone was resected.

The hæmorrhagic lesions appear to be due to a minute lesion in a blood-vessel of the muscularis mucosæ. The hæmorrhagic area is conical, its base coincident with the surface of the mucous membrane. The non-hæmorrhagic areas are small, conical, pale, and few in number. These mark the first stage of a specific kind of ulcer which presents the characteristic features of true chronicity. Disturbed innervation will suffice to create lesions presenting the characteristics of acute and chronic ulcer in man. As both forms are found in the same region of the same stomach, there is reason to assume that time does not play a paramount part in the process. Neither can the size be responsible for its insufficient healing. Overstimulation, rather than insufficient innervation, of the middle splanchnic seems to be the principal cause of hæmorrhagic gastric ulcer. The non-hæmorrhagic lesion is a spastic disturbance due to the action of adrenalin. This action causes rupture of the blood-vessels at some points, spastic contraction in others. Trophic disturbances are not sufficient to cause ulceration unless accompanied by vascular disturbances. It does not seem logical to assume that gastric ulcer should be caused by a single etiologic factor since it is associated with the most widely divergent clinical syndromes, but in the majority of cases the ulcer appears with no apparent relation to other diseases. Ulcer may be produced by any agent capable of damaging the sympathetic nervous system, as it is on the integrity of this system, which

controls circulation, secretion, and profound sensibility in the stomach, that the very life of the gastric cell may be said to depend. The theory of "trophic ulcer" must be taken in this sense.

**Andresen, F. R.: The Treatment of Gastric Ulcer, with Especial Reference to Its Etiology as an Infective Process. *Med. Rec.*, 1916, lxxxix, 457.**

After a preamble in which he briefly reviews the experimental evidence that gastric ulcer is the result of an infective process, the author proceeds to a consideration of the rational treatment of ulcer.

In simple ulcer, acute or chronic, as an infective process, the indications for treatment are: (1) to remove the cause of the infection; (2) to procure rest for the infected part; and (3) to aid nature in its efforts to overcome the infection and repair the damage done. Gastric atony, gastroptosis, intestinal kinks, improper habits of diet, and occupations causing continued pressure against the epigastrium are sought for as possible contributing causes and corrected if found. The most important point, however, is the search for and elimination of all sources of chronic infection such as septic foci in teeth, nose, throat, etc., which the author considers the most frequent cause of relapse. In a series of 96 cases infections of the teeth and gums were present in 81 per cent, of the nasopharynx and accessory sinuses in 15.6 per cent; other infections were found in 3.6 per cent. In practically all cases the streptococcus viridans was isolated in pure culture.

The author regards excision of an uncomplicated ulcer as indicated only after prolonged and adequate medicinal treatment has done no good. Simple gastro-enterostomy is regarded as a palliative method which must be followed by months of strict ulcer diet to afford permanent relief. If operation is indicated, excision of the ulcer is the operation of choice.

Rest of the affected part is obtained by proper diet, rest in bed, demulcent coating of the ulcer, neutralization of the hyperacidity, by the use of quieting drugs and proper attention to the evacuation of the intestinal tract. Each method is discussed with more or less detail. The author condemns duodenal feeding on the ground that the tube, a foreign body, will cause greater excitability of the stomach.

To aid nature in its efforts to overcome the infection and to institute reparative processes, the author places the greatest reliance upon autogenous vaccines which are prepared from the foci of infection. In from six to twenty-four hours after the first injection there is, as a rule, a distinct general reaction with an exacerbation of the ulcer symptoms followed by a marked improvement. Three case histories are cited to illustrate the author's methods more explicitly.

The complications of gastric ulcer are hæmorrhage, perforation, disturbances of motility, and carcinomatous degeneration. With hæmorrhage,



rest in bed is imperative until the hæmorrhage has ceased. Horse serum subcutaneously is indicated in severe cases, while gelatin by mouth and calcium by mouth or rectum are the safest routine agents. Rectal feeding is of doubtful value, but dextrose or lactose solutions should be tried when it is necessary to prohibit all food by mouth for some time. Severe hæmorrhages which threaten the life of the patient require opening of the stomach and suture of the bleeding point, or preferably excision of the ulcer.

Perforation, whether acute or chronic, requires operation as soon as the diagnosis is made. Severe disturbances of motility likewise require suitable operation. Carcinomatous degeneration requires operation as early as recognized or even when only suspected.

E. FISCHEL.

**Della Torre, P.: Total Endogastrectomy** (L'ablazione totale della mucosa gastrica). *Clin. chir.*, Milano, 1916, No. 1, 29.

The author's conclusions relative to the technique employed and the results, macro- and microscopical, of recent experimental researches are as follows:

1. The total ablation of the gastric mucosa is highly possible, making recourse to separation.

2. The scraping carried on at the cardiac and pyloric orifices, in order to guarantee total ablation, should not in any case attack too deeply the tunica muscularis in order that the danger of cicatricial stenosis may be avoided, following the reversing of the bleeding surface.

3. Total, subtotal, or partial extirpation of the gastric mucosa is never followed by necrosis with subsequent perforation of the gastric wall.

4. The regeneration of the gastric mucosa, proceeding relatively rapid from the germinating centers represented by the stratum glandularis of the cesophagus and duodenum, terminates by regeneration shortly of the entire internal surface of the stomach, more or less accentuated, in a limited space of time, differing in various animals.

5. The regenerated mucosa shows a perfectly normal histologic structure.

6. The secreting function of the stomach does not appear at one time, but increases with the regeneration of the gastric mucosa. Traces of free HCl in the gastric contents were not found even as late as eight months after the operation.

RAOUL L. VIORAN.

**Lewisohn, R.: Pyloric Exclusion, an Experimental and Clinical Study.** *Surg., Gynec. & Obst.*, 1916, xxii, 379.

Up to a few years ago simple gastro-enterostomy was considered the method of choice for the treatment of gastric and duodenal ulcers. Most surgeons, however, now agree that pyloric exclusion in some form ought to be added to this procedure in order to permanently cure pyloric and duodenal ulcers. It is a well known fact that simple gastro-

enterostomy does not prevent the food from passing through the pylorus and over the ulcerated area.

The author states that there are five different methods of pyloric exclusion but that none of them, with the exception of Eiselsberg's method, assures a permanent exclusion. He reports experiments with a modified Biondi method. This modification ensures permanent exclusion. The technique, however, is too difficult, and the method therefore should not be applied in clinical surgery. He shows the stomach of a dog operated upon according to the Biondi method and killed three months after operation. The pylorus was wide open and scarcely any sign of surgical interference could be seen.

He further demonstrates a human pylorus which he resected in July, 1915. This patient had undergone a gastro-enterostomy and pyloric exclusion with the string method eighteen months previously. The pylorus was patent, admitting the little finger, the stitch was still *in situ*. He concludes that the clinical results are just as good in using the most simple method (exclusion stitch), as in the use of the most complicated method (Eiselsberg). Though the exclusion stitch does not ensure a permanent exclusion of the pylorus, it ensures a temporary one and thus effects the healing of the ulcer.

The author formulates his conclusions as follows:

1. With the exception of Eiselsberg's unilateral exclusion and the modified Biondi method, none of the different methods of "exclusion" guarantees a permanent occlusion of the pylorus.

2. An absolute, though temporary, "exclusion" of the pylorus provides for a permanent cure of pyloric and duodenal ulcers.

3. The most simple method from a technical standpoint is the "exclusion" stitch (Kelling-Berg-Cackovic). This stitch should be used in preference to the more complicated methods (Wilms, Parlavacchio, Biondi).

4. The Eiselsberg method and the modification of the Biondi method, though guaranteeing a permanent "exclusion," are technically too complicated and should not be used.

5. The clinical results are just as good in using the most simple method (exclusion stitch) as in the use of the most complicated method (Eiselsberg). The exclusion stitch can therefore be considered as the method of choice for the treatment of pyloric and duodenal ulcers.

**Jefferson, G., and Flumerfelt, G.: The Anatomical and Physiological Subdivisions of the Duodenum, with a Note upon the Pathogenesis of Ulcer.** *Ann. Surg.*, Phila., 1916, lxiii, 318.

The subdivisions of the duodenum as commonly given in anatomical textbooks are very artificial and are neither physiological nor embryological. The use of these subdivisions as the basis of classification of lesions of the duodenum leads to much inaccuracy and confusion in interpreting diseases of this portion of the alimentary tract. The au-



thors believe that it would be much better to divide the duodenum into two parts, cephalad and caudad to the bile-papilla (papilla major Santorini). These parts are called "supra-" and "infrapapillary." This classification is not only developmentally correct but stands the test of pathology.

An examination of the records of 496 definite cases of duodenal ulcer shows that they are very common in the acid suprapapillary portion; that their incidence decreases as the papilla is neared; and that they are extremely rare in the alkaline "infrapapillary" region (only one case of the series).

Statistics show that duodenal carcinoma is commonest in the second part, but this is due to the inclusion of vaterian cancers in the total of duodenal neoplasms. When these have been subtracted carcinoma seems to be more common in the suprapapillary region than elsewhere in the duodenum. This is probably due to the greater incidence of chronic ulceration in the former, although cancer following duodenal ulcer is notably rare.

GATEWOOD.

**Dodge, G. E.: Cystic Dilatation of the Vermiform Appendix.** *Ann. Surg.*, Phila., 1916, lxiii, 334.

From a review of 142 cases of cystic dilatation of the appendix, the author is led to believe that the condition is relatively rare, and that true hydrops forms less than 9 per cent of all appendiceal cysts. From the evidence obtained from the collected cases, it seems that these cysts are essentially retention cysts of inflammatory origin. The lumen of the appendix, while often completely or partially obliterated, may be patent. The condition runs by no means a symptomless course; symptoms being present in 24 per cent of all cases, and in at least 51 per cent of operative cases.

The contents of some of these cysts when implanted upon the peritoneal surface are capable of producing the condition known as pseudomyxoma peritonei. Some of the appendiceal cysts present structural and clinical characters that seem to ally them with adenocystomata. Carcinomatous changes have been occasionally observed, although some cases reported as carcinoma have lacked the clinical aspects of malignancy. The author furnishes a table with the literature of the 142 cases which he has been able to find and includes one case of his own.

GATEWOOD.

**Wachenheim, F. L.: A Contribution to the Diagnosis of Appendicitis in Childhood.** *Arch. Pediatrics*, 1916, xxxiii, 197.

The subjective sensations available in intelligent children are a valuable aid in diagnosis. High palpation of the right iliac fossa, per rectum, elicits tenderness and pain in the McBurney region when appendicitis is present, never under normal conditions. To determine this point it is necessary to observe certain precautions. In the first place, the confidence of the little patient must be gained,

assuring him that the procedure will not be distressing. Secondly, the examining finger must be introduced quite painlessly. This can always be done if patience is exercised. The ordinary rectal examination is far too often conducted brutally, causing the patient considerable pain and alarm.

The valuable diagnostic point consists in the fact that the patient complains of no discomfort until the introduced finger reaches the right iliac fossa, when the child complains of a sharp pain in the neighborhood of McBurney's point.

EDWARD L. CORNELL.

**Soper, H. W.: Polyposis of the Colon.** *Am. J. M. Sc.*, 1916, cli, 405.

In 1907 Doering collected 52 cases from the literature and the author now adds 8 new ones, reporting one of his own in which the entire colon was successfully resected.

These 61 cases show that the growths are most frequent in children; 43 per cent were adenocarcinoma, usually of the rectum, sigmoid, or splenic flexure; the small intestine is rarely involved, and there is a family tendency.

Esser, Carroll, Lindner, and Lilienthal report cases successfully operated on.

The case reported was that of a male, aged eight, with a history of diarrhoea since infancy. Two years previous, anal prolapsus was followed by the removal of a small polyp from the first valve of Hanston. At the same time a small polyp was removed from the cheek — both were simple adenoma. Two months later two polypi were removed by snare, three inches from the anal margin. Again, sixteen months later four growths five inches from the anal margin were removed in like manner. During the entire time occult blood persisted in the faeces and colonic involvement was diagnosed.

Abdominal section was done with removal of the entire colon, the anastomosis being made by a Murphy button. Rapid recovery followed and one year later sigmoidoscopic examinations showed no recurrence, but considerable dilatation of the rectum and sigmoid. The pathological report was benign adenoma.

P. M. CHASE.

**LIVER, PANCREAS, AND SPLEEN**

**Ugaz, R. I.: Retrograde Cholecystectomy for Chronic Calculous Cholecystitis in a Man of 78** (Colecistectomia retrograda par colecistitis cronica calculosa en un hombre de 78 anos). *Cron. med.*, 1916, xxxiii, 66.

In Deaver's report of 159 interventions for cholecystitis up to 1914, the greatest age among the operated was 70 years, and the author has not found this age limit exceeded in a research through the literature of the subject.

His own case was in a man of 78, who, after undergoing medical treatment for more than twelve months in a hospital without relief, was finally

operated upon. The cholecystectomy was done following the classic procedure. On the eighth day there was a slight recurrence of biliary symptoms which passed away, and recovery was fully established after thirty days.

W. A. BRENNAN.

**Mitchell, W. T., Jr., and Stifel, R. E.: The Pressure of Bile Secretion During Chronic Obstruction of the Common Bile-Duct.** *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 78.

In animals with experimental obstruction of the common bile-duct the authors have frequently observed that a rupture of the bile passages often occurred with escape of bile into the peritoneal cavity. They therefore undertook a series of experiments to ascertain whether, following an obstruction, there was a rise in pressure within the bile passages from day to day.

Under aseptic conditions the common duct was ligated with silk thread as near the duodenum as possible, and the animals were allowed to recover and given food and water, and then from time to time pressure within the bile duct was recorded. In 12 cats the pressure ranged from a minimum of 236 to a maximum of 360 mm. with a mean pressure of 278 mm. The authors found that the pressure remained remarkably constant, not rising or falling more than a few millimeters during several hours. They obtained no uniform variation in bile pressure by the stimulation of nerves. Electrical stimulation of the vagi gave a rise of 4 or 5 mm. Their experiments therefore showed that in chronic obstruction of the common bile-duct the pressure rose no higher than in acute obstructions. It might be even higher at the end of three hours than at the end of three days, but probably there would be little variation. They found that there were individual variations which they did not attempt to explain, but there was no relation between the pressure and the weight of the animal.

The authors therefore feel safe in assuming that the pressure in the bile-duct rises sharply during the first three hours after obstruction. After this time it remains fairly constant, but is the result of two factors: (1) secretion by the hepatic epithelium, (2) absorption by way of the hepatic veins.

GEORGE E. BEILBY.

**Jablons, B.: Concretions of the Spleen.** *Calif. St. J. Med.*, 1916, xiv, 103.

Concretions of the spleen are very rare, in fact only two cases were found in the literature by the author. All stones have been found accidentally at autopsy. Several theories are advanced as to their origin: (1) old calcified tubercles; (2) calcified hydatid cysts; (3) calcified thrombi.

The author's case was that of an old man who died subsequent to an operation for carcinoma of the penis. The post-mortem was not remarkable except that it showed several concretions near the hilus of the spleen. These were partially infiltrated with

connective tissue. The conclusion of the author was that they were phleboliths.

J. H. SKILES.

**Silvestrini, L.: Extirpation of the Spleen in the Pathology of the Liver and the Blood** (*Estirpazione della milza nella patologia del fegato e del sangue*). *Riforma med.*, 1916, xxxii, 266.

Some morbid conditions of the blood and of the liver owe their origin to alterations developing primarily in the spleen and which thence diffuse secondarily to the liver and to the blood; in others splenopathy figures as the prevalent factor in the morbid syndrome.

Attempts have therefore been made by various therapeutic means to act on the spleen directly and destroy toxic processes in their inception; but the failure to accomplish this by medical agents has led to the use of more radical measures. There is no agreement as to the exact value of splenectomy, as the functional effects of the spleen on the organism are not definitely known.

Silvestrini has made a number of animal experiments to determine the effects of splenectomy. These experiments, made on rabbits, show that the age of the animal and the conditions of life effect the results.

Splenectomy in rabbits produces:

1. A diminution of erythrocytes if the animals are very young; an increase if they are adult.
2. A diminution of the hæmoglobin contents if the animals are adult.
3. An increase of the globular resistance of the erythrocytes whatever the animal's age may be, but this returns to normal after about eight months.

With regard to the relations which exist between the spleen and the other organs, Silvestrini's researches have resulted in these conclusions:

1. Extirpation of the spleen is well tolerated in rabbits and does not cause any alterations which are macroscopically appreciable in the different organs of the body. However, such an animal while it shows greed for food does not show a development compatible with its alimentation.

2. After extirpation of the spleen, there are no immediate manifestations in the liver. Later there is observed a lymphatic hyperplasia first about the portal vessels, then in the hepatic lobes. There is an increase in the weight of the liver some time after splenectomy. Later still there is a slight alteration in the hepatic cells, but the alteration does not appear to be equal in the different lobes, which is not in agreement with Glénard's hypothesis that there is a functional anatomic automatism in the two hepatic lobes.

The author applies these results to the surgical practice of splenectomy. He thinks this operation is indicated in splenic anæmia (Banti's disease), chronic hæmolytic splenomegalic icterus, hæmolytic anæmia, early primitive tuberculosis of the spleen, and leukæmia. In the case of pernicious anæmia and infantile splenomegalic anæmia the value of splenectomy is doubtful, while in kala-azar and allied conditions it is contra-indicated.

W. A. BRENNAN.



## SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES,  
TENDONS. CONDITIONS COMMONLY  
FOUND IN THE EXTREMITIES

**Horwitz, A. E.:** *The Changed Character of Later Lesions Occurring in So-called Healed Tuberculous Joints.* *J. Mo. St. M. Ass.*, 1916, xiii, 114.

In all the cases observed by the author, the findings were constant and as follows: At an early age the patient suffered from a typical attack of tuberculous disease. The treatment was in accordance. A cure resulted in due time. A period of freedom existed for a number of years, ranging from five to ten. Pain began to recur gradually. This was noted upon use of the part only. There was no pain at night or when at rest. The pain was greatest on first use of the joint, decreasing as motion or exercise increased. The same objective signs and findings were noted. Motions of the joint were limited when first manipulated. Further manipulations increased the range of motion and diminished the pain. Slight tenderness existed. Referred pain was noted. The roentgen ray showed the old necrosed bone with new tissue replacing it. With these findings the treatment naturally consisted in manipulations and massage, the reverse to that employed in the original condition.

EDWARD L. CORNELL.

**Silver, D.:** *The Rôle of Visceroptosis in the Etiology of Arthritis Deformans.* *Tr. Am. Orth. Ass.*, Washington, 1916, May.

After outlining the present understanding of visceroptosis and its influence on alimentary toxæmia and emphasizing the extremely complex etiology of arthritis deformans, the author assumes that in many cases in which the two coexist the visceroptosis is of the secondary acquired type; further, that in any case in which there is a primary visceroptosis of sufficient degree to interfere with function it necessarily acts as a predisposing factor in the production of the arthritis and may be the deciding factor.

The questions left for discussion are: (1) how frequently alimentary toxæmia may act as such a deciding factor, and (2) whether the toxins, bacterial or chemical, thus enabled to enter the circulation may directly induce joint change.

The laboratory and clinical evidence bearing upon the nature of the toxins in alimentary toxæmia is reviewed and the published cases in which operations for the relief of intestinal absorption in arthritis deformans have been performed are analyzed. From this study the author concludes: "It seems to have been demonstrated that the active agent in arthritis deformans may enter through the intestinal tract. This active agent is undoubtedly bacterial, probably most commonly streptococcic, and the

intestinal mucosa is thus to be regarded as one of a number of mucous surfaces through which infection may enter the system. Through the production of stasis and probably also through its influence on glandular secretions, visceroptosis acts to cause increased intestinal infection and so favor systemic invasion; thus in an individual with lessened joint resistance it may be the deciding factor in the development of arthritis. How frequently arthritis develops in visceroptotic subjects and what the proportion is between the number of cases of arthritis due to this cause and that arising from other intestinal affections cannot now be stated.

**Boehme, G. F., Jr.:** *Plasterers' Corns and Bunions.* *Med. Rec.*, 1916, lxxxix, 560.

A peculiar deformity found in plasterers' hands is caused by the use of the "hawk," a flat board with a central handle underneath it on which the plaster is held. Clinically the condition is a large bursa, like a typical bunion, found over the external aspect of the metacarpophalangeal joint of the thumb, varying in size from a quarter dollar to a fifty-cent piece. A smaller bursa is often found over the same joint of the index-finger. Over the first interphalangeal joint of the index-finger and the corresponding joint of the thumb are two hard callous areas or corns.

The etiology of the condition is found in the manner in which the "hawk" is held, the central handle being grasped in the left hand, the board resting principally on the metacarpophalangeal joints and the flat surfaces of the index-finger and the thumb. The weight of six to eight pounds is thus borne for about eight hours a day to which is added the constant irritation of the board as it is rotated as the plaster is gradually removed. The treatment is prophylactic directed to the removal of the cause, toward this end the author having devised a new form of "hawk" which consists of a board with a handle revolving within a cylinder thus doing away with the constant friction. For early cases local soothing applications are advised with later use of the new form of "hawk." For long standing cases, inflamed bursæ are treated like those found elsewhere in the body. Calluses may be removed by caustics or any salicylic salve.

R. S. BROMER.

## FRACTURES AND DISLOCATIONS

**Taylor, G.:** *Some Notes on War Fractures.* *Practitioner*, Lond., 1916, xcvi, 244.

The author gives a dissertation on fractures occurring in warfare. The surgeons have been guided by the principles laid down by the British Medical Association Committee on the treatment of fractures, which are somewhat as follows:

1. In cases treated by non-operative methods, the older the patient, the worse the result.

2. In cases treated by immediate operation, the deleterious influence of age upon the functional result is less marked.

3. In nearly all age groups, the operative cases show a higher percentage of good results than non-operative cases.

4. Although the functional result may be good with an indifferent anatomical result, yet the most certain way to obtain a good functional result is to secure good anatomical alignment.

5. Operative measures are not to be regarded as a method to be employed in consequence of the failure of non-operative measures, for the results of secondary operations compare very unfavorably with those undertaken immediately after the injury; in order to secure the best results of operation, this should be resorted to as soon after the accident as practicable.

6. The method is not to be undertaken except by such as have skill and experience in surgery, and the surroundings must be such as to ensure asepsis.

Fractures in the neighborhood of joints, and fractures complicated by nerve injuries, are almost always submitted to operation. Lane's technique was employed. The author condemns the treatment of compound fractures which are infected by plating. In case shortening should demand plating, it is wise to allow several weeks to elapse after the wound has healed before operation is undertaken. If the application of extension and splints does not give a good anatomical and functional result, he advocates open operation. He thinks it is wise in compound, comminuted fractures in the neighborhood of joints, to remove adjacent fragments of bones when necessary. He quotes Sir John Glen Sutton in advocating such treatment in gunshot wounds of the upper end of the humerus. Amputations are undertaken only when general septicæmia threatens life. Death has been the usual outcome when rapidly spreading gangrene has followed ligation of the femoral artery because of hæmorrhage, in compound fractures of the thigh. He has gained a very favorable impression of the usefulness of sulphur and glycerine emulsion as an antiseptic in infective cases.

H. G. SLOAN.

**Lemon, C. H.: Is It Possible to Obtain Bony Union in Intracapsular Fractures of the Hip-Joint?**  
*St. Paul M. J.*, 1916, xviii, 86.

The author notes that fracture of the neck of the femur is a comparatively rare occurrence, and in proportion to the population it occurs more frequently in rural districts than in the city. He states that the family physician is not as a rule sufficiently informed as to the possibilities of treatment in this class of cases and does not inform the patient in time as to what may be accomplished, and Lemon is inclined to recommend that these cases be placed in the hands of a specialist in large clinics.

He laments the confusion of thought on this subject and that the average medical man does not know the difference between an intra- and an extracapsular fracture clinically. The teachings of Sir Astley Cooper that intracapsular fractures of the femur were incapable of bony repair, excepting in the cases where no actual separation of fragments had occurred on account of the untorn periosteum of the neck, Lemon believes untrue. Portions of the Hunterian Lecture of E. W. Hey Groves, for the year 1914, is reviewed and the author criticizes the experiments undertaken, because in the experiments a condition was created that never occurs in simple fractures. A fundamental law in the healing of fractures is that bony apposition of the fragments must be obtained if callus is to be obtained.

The author has treated about 50 cases of fracture of the hip-joint during the last fifteen years, according to a definite theory, with uniform success. His central thought has been approximation of the fragments, his experience being that where the fragments were approximated and held immovable from two to four months in a well applied spica dressing the patients suffered no pain. They had no bed-sores and they ultimately walked without a crutch or a cane, and, excepting in those cases that were nailed, they walked without a limp. In view of this experience he is unable to understand the attitude of some leading fracture experts, in persisting in the statement that a functional result is all that can be hoped for in the majority of these cases. Lemon believes that what is possible in the treatment of other fractures in joints is possible in the treatment of fractures of the hip-joint. He believes in the proper application of the Whitman method, emphasizing the correct manner of applying the plaster-of-Paris spica as being of very great importance in the success of the treatment. This he believes will prevent failure in from 90 to 95 per cent of the cases, and is the treatment recommended by him.

EMIL C. ROBITSHEK.

**Wight, J. S.: Methods of Treating Oblique Fracture of the Femur.** *Am. J. Surg.*, 1916, xxx, 86.

Wight advises waiting five or six days before undertaking the open reduction method. He secures the oblique fragments with screws and removes all mechanical devices after they have served their purpose, as they are foreign bodies and tend to cause irritation. The best and most accurate method of extension is by means of the Steinmann pin through the bone, so the pull will be applied directly to the distal fragment.

R. B. COFIELD.

**Hungtington, T. W.: Fracture Records; a National Effort Toward Standardization.** *Northwest Med.*, 1916, xv, 114.

The author emphasizes the absence of any complete fracture records either in hospital or in private work and refers to the important relation of the recent legislation of compensation laws to the end-result of fracture treatment. He gives the "frac-



ture schedule" recommended by the Committee on Fracture Treatment of the American Surgical Association and makes a plea for its adoption by hospitals, physicians, and insurance companies, in order that a more exact knowledge of the end-results of different methods of treatment, which are based upon the permanent functions of the affected part, may be obtained. E. B. MUMFORD.

**Allen, H. E.: A Plea for Conservative Treatment of Fractures.** *Northwest Med.*, 1916, xv, 111.

Allen feels that there is a conservative field for the treatment of fractures and that a great many open operations are unnecessary and expose the patient to infections. He emphasizes the fact that the alignment is more important than a perfect end-to-end apposition.

The use of Lane plates in old ununited fractures and deformities is condemned and the bone-graft is advised instead. The author feels that the indication for operation in a fracture is the inability to obtain apposition and alignment.

E. B. MUMFORD.

**Lane, A.: The Operative Treatment of Fractures in Warfare.** *Practitioner*, Lond., 1916, xcvi, 231.

Lane gives an account of fractured bones treated by plating, and the text is profusely illustrated with radiograms.

Attention is called to the fact that fractures received in warfare usually show more comminution of the bone because of the force of the projectiles, in contrast to that seen in civil life. Infection follows more frequently because of the fact that bits of clothing and dirt are carried in by the projectile. He does not advise fixation of fragments in compound fractures where there is infection immediately after the receipt of the injury. In case fixation may be necessary for the comfort of the patient, it is best to place the screws at some distance from the site of the fracture in order to avoid further rarefaction of the bone from the screw holes becoming secondarily infected. The plates now used in bone work, in connection with the war, are much stronger than those formerly used in civil practice. In case it is necessary to plate a compound infected fracture, it is wiser to allow several weeks to elapse after the injury has been received before operating.

The author lays stress on his plan of putting the bones in alignment by means of plates where there has been loss of substance in the bone, after allowing for any shortening. When the ends are not in contact, they will regenerate enough bone to bridge the gap, if the effect of engorgement is taken advantage of by allowing the patient to be up with an ambulatory splint applied. If any septic focus is observed during an operation, a culture and vaccine should be obtained and employed at once, should symptoms of wound infection develop. It is most important that the joints which are in relation to the fractured bone shall be moved as

soon as possible after operation, in order to avoid stiffness in the joints. Being up and around, with an ambulatory splint, materially increases the amount of callus at the site of fracture. Should rarefying osteitis exist, it is evident that the technique of the operator is faulty. H. G. SLOAN.

**Preston, M. E.: Conservation in the Operative Treatment of Fractures.** *Colo. Med.*, 1916, xiii, 83.

New therapeutic measures are often too readily taken up and as readily discarded even before their efficacy has been tested. Bleeding, oophorectomy, salvarsan, and sodium cacodylate are cited as examples. Preston urges that scientific consideration be given each new measure before it is heralded or condemned.

The principal factors pointed out as necessary in operative treatment are exactness, proper technique, full appreciation of the mechanical factors, a good working knowledge of anatomy, and a full appreciation of the laws of stress, strain, and leverage.

Selected cases of fracture are suitable for surgical treatment. The method of fixation is largely determined upon by the nature of the tissue dealt with, whether it is compact or cancellous bone. Longer bone plates with the Sherman self-tapping screw with proper setting and only a moderate degree of tension give the best results. Rigid asepsis with due consideration of the laws of stress, strain, and leverage, and the nature of the tissue adds much to the success or failure of the operation.

H. W. MALTBY.

**Peckham, F. E.: Congenital Elevation of the Scapula; A New Operation? Cubitus Varus.** *Boston M. & S. J.*, 1916, clxxiv, 315.

The operation described is new and original and it would seem very logical in its results.

The author discusses briefly the cause, which usually is stated as being a bridge of tissue or bone which anchors the scapulæ to the ribs or spine. The old operation was to remove this bridge. In the author's case, there was no such bridge to be found, and this is the type of case left untreated. The operation he recommends consists in removing a wedge of the trapezius muscle, suturing the angle of the scapulæ to the spine low down, and uniting the gap left by the removal of the V-shaped wedge of the trapezius.

Cubitus varus, or gunstock deformity, usually follows fractures of the lower end of the humerus.

The author believes that in most cases prevention of rotation of the forearm is not well carried out and because of the rotation, the deformity occurs.

He describes his case and illustrates the method of strapping the hand to prevent rotation.

C. C. CHATTERTON.

**Baldwin, C. H.: Old Dislocation of the Clavicle in a Child.** *Am. J. Orth. Surg.*, 1916, xiv, 152.

The patient fell down two or three stairs when three years old and fractured her left clavicle.

At the age of nine, a roentgenogram showed the sternoclavicular articulation on the affected side one and one-half inches lower than the right. A new joint with perfect function had formed on the injured side.

PHILIP LEWIN.

### SURGERY OF THE BONES, JOINTS, ETC.

**Tuffier, T.: The Functional Status of Amputation Stumps in War** (*L'état fonctionnel des moignons des amputés de guerre. Arch. de méd. et pharm. mil., Par., 1916.*)

The author's purpose was to determine the best amputation procedures, based upon the practical value of the stumps obtained. The information was gained from 13 reports by the chiefs of the orthopedic services of the military regions and from the author's personal reports in the amputation service and ambulances at the front, comprising 2,031 documents.

The method of examination was uniform for all cases: after searching for the cause of amputation and that of all the consecutive accidents, a radiograph was made; photographs and radiographs were taken of the stump both before and after the operation. The relative frequency of each variety of amputation in the present war in France based upon statistics from Lyons, Le Mans, Montpellier, Nantes, on 1,538 cases, as well as those of the Maison Blanche, comprising 1,731 cases (Maison Blanche is the author's clinic), is as follows:

For the upper extremities 622 cases:

- 348 arm amputations
- 145 forearm amputations
- 77 shoulder dislocations
- 18 elbow dislocations
- 34 wrist and hand dislocations

For the lower extremities 1,109 cases:

- 670 thigh amputations
- 297 leg amputations
- 86 partial foot amputations
- 29 hip dislocations
- 27 knee dislocations

Amputations, double and multiple, 45 cases, including one case in which both arms and both legs had to be amputated. Of these 45 amputations 29 were done at one operation, 16 at two sittings.

Adding to these figures those furnished by the chiefs of the orthopedic services, and classifying the amputations by order of frequency, the result is:

- 1,063 thigh amputations
- 548 leg amputations
- 542 arm amputations
- 251 forearm amputations
- 110 foot amputations
- 125 shoulder dislocations
- 58 hip dislocations
- 47 knee dislocations
- 41 wrist dislocations
- 33 elbow dislocations

Of the 1,731 amputations, 257, or 17.4 per cent, had to be operated upon twice. Interrogation of

the 1,731 wounded brought out the fact that 279 of them had had before from 2 to 4 successive amputations, 16.1 per cent. After an amputation, a mutilated soldier has 30 out of 100 chances of having to submit to a new operation, considering that in 536 cases the first operation was not sufficient, or a percentage of 30.9.

Estor's statistics are quoted showing 90.5 per cent good upper extremity stumps and 9.5 per cent bad ones; 68 per cent good thigh stumps, and 32 per cent bad ones; 53 per cent good leg stumps and 47 per cent bad ones.

Of the 279 amputations that had to be retouched or re-operated, the lower extremities were involved in 252 cases — 111 hip, 141 leg — and only 27 cases of upper extremity involvement.

As to the choice of operative procedure, the general opinion and the author's personal observations establish the fact that the secondary operations that had to be performed were due to the classical circular incision, which procedure still has some staunch sustainers. War surgery, surgery in the field, operations day and night, clearly show that the circular amputation, simple and rapid, can not enter into the good practice of war surgery. It is difficult to tell in which selected cases it may be found to be indispensable. The general rule holds that a limb must be sectioned as far away from its root as possible; or the circular method gives in this respect a maximum result. The flap methods need a higher bony section, another disadvantage which can be offset by the possibility given the wounded to walk on the well-padded extremity of his stump, which gains in sluggishness to compensate what it loses in length. If the old imperfect circular method of amputation cannot be abandoned, cannot the results be improved by choosing the time of operation? Will an immediate, retarded, or late amputation allow of an amelioration in the condition of the cicatrices? Some authors are uncertain about it; others claim it is indifferent. The immediate operation eliminates the great majority of secondary accidents, its greatest advantage being that it gives the softest cicatrices; but it is also serious in certain cases, as it may help to destroy a limb which could probably be saved otherwise; the disadvantages will decrease in proportion as new means of combating infection are discovered.

As for the seat of amputation, the author believes in choosing a place at a distance from the focus proper, to avoid infection and deplorable cicatrices; to cut at the hip even for a crushed tibiotarsal. The decision as to the point of amputation is based upon the seat of the wound; the bone lesions; the nature of the projectile; the shooting distance for bullet wounds; finally, the close examination of the traumatic focus and the surrounding regions.

If amputation is done secondarily, far from the wound above the inflamed area where gangrene is feared a bone segment may be removed that could have been saved by a primary operation and the



cicatrix would certainly be less favorable. Each case requires individual consideration. A pathological stump may be considered sufficient if it is not painful.

The lesions that render an amputated limb unfit for an artificial limb in 30.9 per cent of cases are, in order of frequency: incomplete cicatrization by ulceration or fistula; pains spontaneous or provoked by the apparatus pressure; often the entities combined. Ulcerations are often caused by too short a flap or by a diseased bone or nerve. Very scant flaps are sometimes cut. Another cause of ulceration is the lack of post-operative care. He considers the operative section, after an operation, as formed of three cylinders, one sliding into the others: (1) the skin; (2) the superficial muscles; (3) the deep muscles, fixed and adherent to the bone. These three planes must be mobile, sliding, and elastic. If in the course of cicatrization suppuration occurs, and this occurs nearly always in urgent amputations, it brings about an adhesion between the three cylinders; there occurs a reciprocal fixation of all cylinders; and elasticity becomes nil. The skin, fixed by its deep side, is no longer capable of covering the entire flat and bare surface; it ends, in lucky cases, by epidermizing, well or poorly, but not by forming a cuticle over the wound, which will result in an interminable cicatrization or a friable cicatrix.

To avoid the necessity for a second operation (the simple dissection of the cicatrix), the margins of the wound must be brought together rapidly, and handled carefully and patiently. This can be done by the use of sutures applied in the superficial muscles, or by fixing on the skin of each flap an agglutinant, provided with a double row of clasps, which exercises an elastic traction upon each wound lip, making a true pliable corset. In other cases the author has seen a sort of bracelet, made of a cast band, applied over the skin that borders the wound; this method is used mostly by the English and Americans. By the aid of the X-ray the author found dozens of suppurating stumps, an index of free sequestra, superficial and deep, some intramedullary. If removed, an immediate cicatrization is obtained. The sequestra are not the result of a simple periosteal denudation, as formerly believed. The hypothesis of an infection at the origin must be accepted. This infection occurs as a rule in all war amputations. The author suggests therefore that periosteal denudation be carefully avoided, as it is unnecessary and dangerous.

Radiographs of other cases showed an osteomyelitis, very frequently found in the femur. They are terminal or lateral. Clinically the stump remains tense, hard, painful. The removal of the mass eliminates such accidents. Lateral osteomyelitis extend 7, 8, or 10 cm. above the bony section, under the form of a new bony cylinder sheathing the diaphysis. They have necessitated three and four amputations in some cases.

The author is not certain as to the final results in cases of lateral osteomyelitis. Referring to the

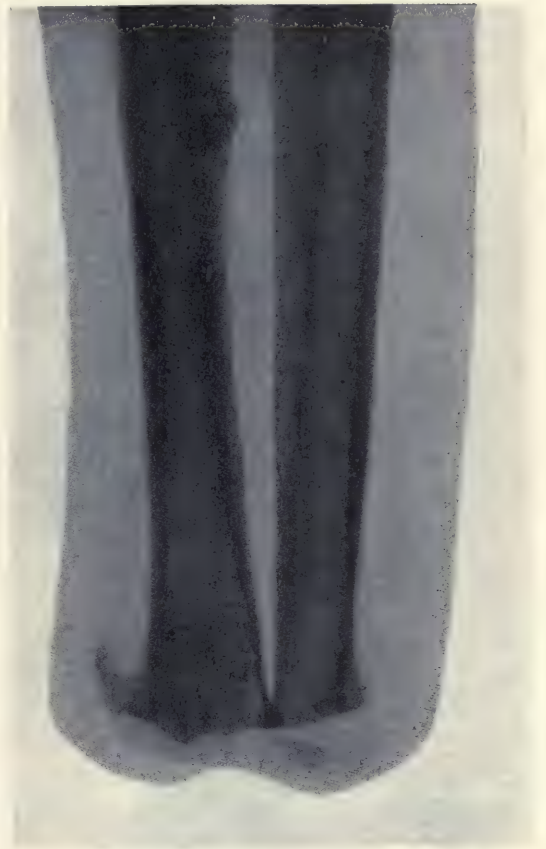


Fig. 1. To the left, radial osteophytis; radiocubital bony point: the pisiform has been omitted in the flap, without interfering with the member's functions, nor with the application of the apparatus.

bony tissue, which he found to be very variable, he discovered most frequently a condition of hypertrophic osteitis, rarefied, at the same time. The consistency of this bone is such that the femur or tibia could be cut with a Farabeuf blade, and by two or three chisel strokes it has been possible to remove the diaphysis entirely. In these cases he obtained two processes: an infectious, and a trophic. The resections of these osteomyelitis are found to be long and tedious; the periosteal tissues penetrate the irregularities of the bony surface and adhere to its projections; the bone bleeds copiously and the persistence of oozing is not favorable to a good union. The fibrous cicatricial parts must be resected or freed, and the cellular tissue brought back to its normal suppleness, allowing the skin to assume a normal surface. To avoid such accident the author insists upon the early disinfection of the wounds, which is the first principle in the treatment of all war wounds.

A condition of true ergot is also extremely fre-

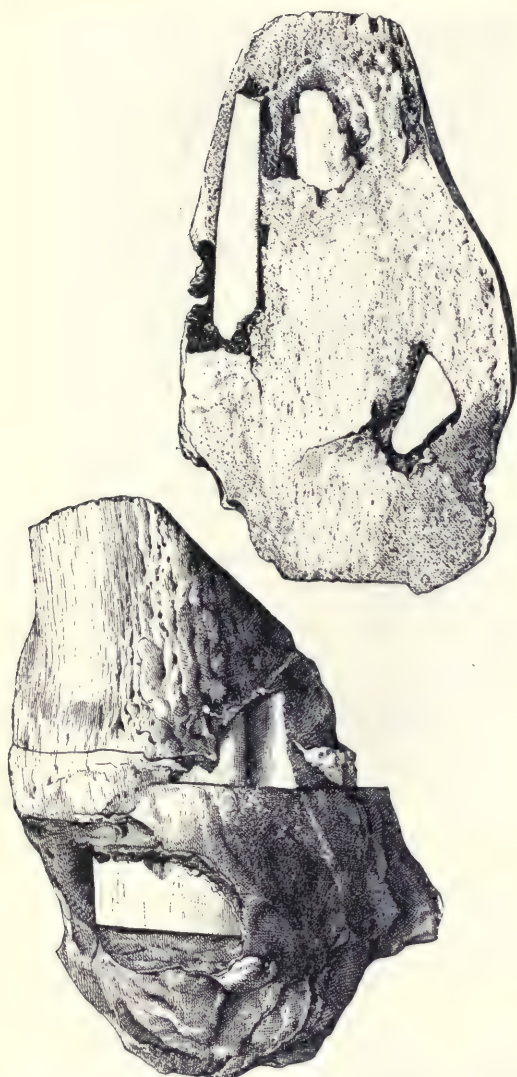


Fig. 2. On the lower left is shown an example of osteomyelitis with a central sequestrum, fistula, and ulceration of the hip stump. The section shows the old diaphysis necrosed, enclosed in an incomplete circle of osteomyelitis of new bone. To the right is shown a section of the preceding section, showing that there is not only a necrosis of the diaphysis, but also a series of other isolated sequestræ.

quent, especially in the hip; rarely in the leg and forearm. In the femur they lodge at the level of its posterior and internal parts, on the rough line. They are discernible about one month after amputation, and are from 2 to 6 cm. long, varying in form. Radiographed, they appear like an opaque tissue, and not spongy as the common osteomyelitis look. They are easily recognized and are frequently indolent and interfere little with the prosthesis. Surgeons are warned to redouble their

prudence and attention, and they should watch not only the section of the rough line, but also the periosteal denudation at this level. An amputation of the hip should never be terminated before the condition of the periosteum of the posterior and internal parts of the femur is investigated.

Neuritic pains reveal two causes easily distinguished by the seat of their maximum intensity. A radiograph may show a normal bone, yet the stump may be painful. The pain is usually found over the cicatrix, and can be elicited by pressure; also a nerve stretched upon a bone may produce the pain; the maximum pain is found at the point of traction itself. In the first case, the cicatrix should be removed and the neuroma found; in the second case, the muscle should be incised and a neurotomy performed, with resection of the nerve. To avoid the two accidents, the author recalls Farabeuf's saying: "Resect the nerves above the cutaneous surfaces and protect the nerve from bony contact." Bacteriologically speaking, neuromas are absolutely sterile.

Reamputations are required in cases of too short a flap, ulceration, neurotic pains, osteomyelitis, or sequestræ. One must resect *in situ*, the strictest care being necessary, freeing carefully all sclerotic regions. To avoid the alarming frequency of sepsis, the use of good drainage is recommended, and a redressing of the wound at the least sign of infection. All these regions are in a state of latent microbism, or in a medium favorable to infection; traumatism awakens and diffuses the virulence. The pathogenesis of ankylosis, as known, is due to an infectious process having reached the articulation. In the great majority of cases it is due to faulty treatment. Early mobilization of the amputated members and the use of English suspension apparatus are clearly justifiable. The author recommends that surgeons pay closer attention to the articulation adjacent to an amputation. For the leg, the knee should be maintained in a rectilinear position, as often and as long as possible. For the shoulder, the movements should be practiced before the stump cicatrizes.

Practical conclusions for each variety of amputation are:

A hip amputation should be made as low as possible, the length of the arm of leverage being of prime importance, especially in the upper third of the femur. A stump of 10 cm. is the minimum required to give a good field for applying the new prosthetic apparatus, a femoral lever that should be efficacious. To obtain a good product it is necessary to have a femur 14 to 15 cm. long.

A sub- or intratrochanteric amputation, or the upper fourth of the femur, is harder to fit with an apparatus than a hip dislocation and gives the same functional results: the amputated walk on the pelvis. It should not be abandoned, for it is less dangerous than a coxofemoral dislocation. To diminish the inconvenience the femur should be straightened as much as possible during the healing of the wound.



Amputations by the circular method give terminal cicatrices which have all the defects of seat, form, and adherence; the technique requires further perfecting.

An anterior flap or a combination of two flaps are the procedures of choice. These require a higher incision of the bone and therefore leave a shorter stump, a disadvantage which the circular method lacks; however, the flap method should be preferred wherever the higher bone section necessary does not permit the stump of a medium type to surpass one of a higher type, nor one of an inferior type that of a medium type.

One should further direct carefully the process of cicatrization by the drawing nearer and the methodic traction of the flaps. Intracondyloid amputations of the femur have given good results to Gourdon, Estor, Desfosses, and the author. They permit the patient, with a good anterior flap, to carry the body weight on the extremity of the stump and to walk remarkably well. In all hip amputations, the author emphasizes the necessity of high sectioning of the sciatic nerve and the particular care of the rough line.

According to Desfosses, a former pupil of the author and now surgeon of the orthopedic center at Clermont-Ferrand, after the fixation of the patella under the femur and the suture of the patellar tendon to the anterior fibrous regions, knee amputation with condyloid resection and suture of the patella (Gritti's operation) to the posterior hip muscles gives excellent results.

Knee dislocations proper, with or without the conservation of the patella, give generally unfavorable results. Dissection performed by the author in three cases of reamputation showed the skin closely adherent to the atrophied cartilages, without any sliding. This causes the original pain, and this is the certain consequence of suppuration. It is preferable, therefore, to perform an intracondyloid amputation.

Leg amputations immediately below the articulation (an excellent operation) give good general results. It seems that the skin provided with the patella supports constantly, perfectly, and indefinitely the body weight, when the adherent condyles crush it against the apparatus. The difference in results is due probably to post-operative infection causing adhesions, and not to the skin of the condyloid cartilage. Leg amputations should give a cicatrix that will allow for a point of support on the stump directly or on the tibial notches, and should be performed as low as possible. The experiences in the present war show that an external flap gives acceptable cicatrices, while the circular method furnishes results generally deplorable; a number of such stumps cannot be fitted with artificial limbs, and they require one or two reamputations. The present operative procedure should be modified at the seat as well as in the cutting of the flaps. Chassaignac says that "the place of election is the one of exclusion"; therefore, the place to be selected, if



Fig. 3. Radiography of an amputated leg stump showing an osteitis of the anterior tuberosity of the tibia.

one exists, should be the bony section at the lowest point which will permit the cutting of a good flap. The posterior flap is preferable, and although it may leave a stump a little too large it can be reduced by compression. The author thinks that bones are badly cut in leg amputations. He possesses dozens of radiographs showing the fibula sectioned much too low, far under the tibia. He recommends high sectioning of the fibula. When the amputation is to be done near the knee, less than 8 cm. from the joint, it would be better to cut the bones higher than lower. The very high cutting even in the tuberosity of the tibia gives excellent results and the author recommends its use. In all these amputations, it is advisable to provide for the perfect mobility of the knee, and to direct the cicatrization of the soft parts by elastic molds or by traction.

Tibiotarsal disarticulation, with the cutting of the malleoli, as well as the intramalleolar amputation, gives good results. Subastragalus disarticulation, the osteoplastic amputation of the calcaneus, and the Syme operation are recommended. With these operations the fitting with artificial appliances is easy and the stump is tolerant.

To remedy an amputation, so-called, of Chopart, when the tibiotarsal articulation is placed in flexion and the head of the astragalus carried down and the cicatrix becomes exposed instead of protected, the author had to perform two astragalectomies with calcaneal osteoplasty. In war surgery, when supuration is the rule, the Chopart operation is to be discarded, for to finish it by an arthrosis, fixing the tibiotarsal joint, or to require a particular surveillance of the cicatrization and its sequelæ, is by no means practical. Radiographs show that in many so-called Chopart operations, the scaphoid has been forgotten. Lisfranc's amputation and its analogous operations are unanimously recognized. They give good stumps on which the patient with an orthopedic shoe can walk very easily, even gracefully. The author has seen a great number of such cases due to frozen feet. For an upper limb the result of amputations and setting for dislocations are infinitely more satisfactory than for a lower limb. Only 50 per cent of the cicatrices were found vicious. Amputation as far as possible from the member's root should be an absolute rule.

For the hand, the smallest stump, including but the thenar eminence and a portion of the metacarpal bones, gives services infinitely greater than the most perfect artificial hand that may be substituted. A dorsal cicatrix is the most preferable for the prosthesis.

For the wrist, the palmar flap gives an excellent stump. Circular amputations result in a painful cicatrix, unable to support the pressure.

As to the forearm, the author emphasizes that an amputation too close to the elbow does not make allowance for the attachment of an apparatus for flexion. It is therefore profitable to gain a few centimeters which increase the value of the member 50 per cent. The circular method or the flap method give good results, provided the cicatrix is pliable and free; a condition which is not common. Especial stress should be placed upon the site selected for amputation, for the patient should have the benefit of all movements of flexion and extension. New apparatus help to conserve movements of pronation and supination. It is further advised that during the entire period of cicatrization the mobility of the elbow and that of the radio-cubital articulation be carefully watched. The author has seen a number of cases of articular stiffness, irreducible.

For the arm, the saving of the head of the humerus, if possible, is to be preferred to a complete disarticulation.

From a functional point of view, the very short stumps, less than four fingers in width, are of no use and the prosthesis can furnish an arm for appearances only. Subjacent amputations allow the wearing of an apparatus whose practicability depends upon the mobility of the joint, and cases of ankylosis of that joint are too numerous.

The author is opposed to the practice of excessive removal of constrictions or deep cauterizations, too

close and destructive, which have been banished, fortunately, by all ambulances at the front.

RAOUL L. VIORAN.

**Openshaw, T. H.: Amputations; Their Prevention and After-treatment.** *Practitioner*, Lond., 1916, xcvi, 284.

From the author's personal experience with amputations, he estimates that amputations have increased seven-fold since the beginning of the war over what they ordinarily are in England. Amputations ought to be considered from the viewpoint of the practicability of fitting an artificial limb to the stump afterward. The author thinks that amputations may be avoided in great measure: (1) by absolute rest with sufficient splinting; (2) the application of extension or fixing the limb in plaster of Paris from the first; (3) frequent antiseptic dressings; and (4) free drainage. He considers that the aseptic dressing is useless in war surgery and that dependence should be placed on antiseptic dressings. In general the circular method of amputation is the best in case of gas gangrene or septicæmia. Much time, however, is gained and the healing of the wound shortened if the flaps are so cut that they can be approximated when drainage ceases. Emphasis is laid on the fact that during amputation the nerves encountered must be cut high up in order to avoid a consequent neuroma of the nerve-stump.

Amputation at the hip-joint is best performed by first ligating the femoral vessels, disarticulating the hip, and then finishing the amputation. This type of operation gives a triangular scar and the stump is readily fitted to an artificial leg. A long flabby stump is here a great nuisance, as it cannot rest solidly on the cut of the artificial limb which receives it. In amputations through the thigh, any shaped flaps may be used so long as the bone is well covered. The longer the piece of bone which is left, the more assistance will it be to the patient in managing his artificial leg. The author recommends Carden's method in transcondylar amputations. In this the knee-cap is resected and the long flap is made anteriorly so that the scar comes to lie at the back of the leg. In amputations through the knee-joint the author uses the method of Stephen Smith, in which two lateral flaps are made and the cartilages of the knee-joint and the patella are left. Operation below the knee is best done at the seat of election. The tibial stump may be only 1 inch or as much as 5 inches in length. It is of no advantage to have it longer than this. Either type of flap may be used, lateral or posterior. For practical usefulness to the patient, he advocates amputation at the point of election where there is any question of amputation in the region of the ankle because of the more satisfactory use that the patient can make with this type of stump.

In amputation wounds healing by first intention, the stump can be fitted to an artificial leg in about six weeks. Care must be taken, however, to see



that the stump has shrunk to its final size before an accurate adjustment can be definitely made. The conditions which will prevent an artificial leg from being fitted may be enumerated as follows:

1. Painful bulbous nerves.
2. Necrosis of the bone.
3. Sinus leading to bone or foreign body.
4. Inflammation.
5. Dense, adherent, or eczematous scars.
6. Ulceration.
7. Loose or flabby stump, or too fat a stump.
8. Contracted limb.

He advocates the applying of splints in all amputations done at the seat of election in order to prevent contraction of the knee. In case such should happen, it will be necessary to do a tenotomy on the hamstrings, and in case this does not suffice, to cut the posterior ligament in the knee. The author thinks that the shrinking of this ligament is to blame for contraction of the knee after amputation. The artificial leg should be fitted with a pelvic band when the amputation has been at or above the middle of the thigh, in order to prevent the leg rotating in or out. Casts of the stump, from which the cup receiving it in the artificial leg is moulded, should be made with the patient bearing his weight upon the stump.

In the upper extremity, it is necessary to leave every single portion which is possible. This is especially important in the hand. Even one finger or a thumb which can flex is better than any artificial appliance. The carpus should be left whenever possible, for this enables an artificial hand to be articulated. When the amputation has been above the elbow-joint, the author believes that the arm invented by Karns, of Warren, Penn., will prove by far the most serviceable. The best stump for this arm is that resulting from amputation at the middle of the humerus down to two inches from the wrist-joint.

HARRY G. SLOAN.

**Packard, R. G.: Functional Result of Astragalectomy in Infantile Paralysis.** *Colo. Med.*, 1916, xiii, 93.

The author's report is based upon cases observed in the Boston Children's Hospital during the five-year period from 1909 to 1913 inclusive. The time elapsing between the attack and operation varied from two to eleven years. The deformities of the feet varied greatly and there was often an accompanying paralysis of the muscles of the corresponding leg and thigh.

The operation originally advocated by Whitman but modified slightly consists essentially in the complete excision of the astragalus, more easily in three portions, and the backward displacement of the foot in such a way that the external malleolus may cover the calcaneocuboid joint, and the internal malleolus may be forced into the depression behind the scaphoid. The foot is then held in moderate equinus and the whole limb fixed in plaster of Paris for four to six months.

The aims of the operation are: (1) to secure lateral stability; (2) to obtain a better anteroposterior balance; (3) to overcome shortening of the foot; and (4) to overcome ankylosis by performing the operation subperiosteally.

In the 16 cases lateral stability was secured in a considerable degree in every case. The functional deformities were very well corrected. In the correction of the foot-drop the results were not quite so good. The arcs of passive movement varied from 10 to 70°. The operated feet measured 0 to 1.25 inches shorter than their mates and 1 to 4 inches shallower. The functional results of the operated feet were excellent in 4, good in 6, and fair in 6.

In every case where it was possible to interview them, the parents made the statement that the children showed more efficient control of the extremity than before the operation. PHILIP LEWIN.

### ORTHOPEDICS IN GENERAL

**McKenzie, B. E.: Treatment of Club-Foot.** *Canad. J. Med. & Surg.*, 1916, xxxix, 121.

The author describes the pathological anatomy of club-foot, laying emphasis on the contractures of the various tendons and on the three elements of the compound deformity, equinus, varus, and supination of the foot. He advocates a two-stage procedure, the first being the correction of the varus and the supination elements by means of manipulation on a wedge-shaped block with retention in plaster. If necessary a subcutaneous tenotomy of the plantar fascia is done. The second stage is the correction of the equinus, and if necessary a tenotomy of the tendo achillis is performed. If the latter is done in the first stage it interferes greatly with the correction of the varus. The time required varies from six weeks to three months for the whole procedure.

McKenzie deprecates operative work and retention in any form of dressing in children under one year of age and instead advises manipulation, with emphasis on the correction of the varus part of the deformity. In not more than 5 per cent of children and 10 per cent of adults is any operation necessary and then only a wedge of bone is removed from the outer aspect of the astragalus. All incisions opening up and leaving a gap on the inner surface of the foot are condemned. The neglect of a proper shoe and a proper night brace is also censured. If complete correction has been made and a proper shoe worn there is no need of a day brace. Open incisions to cut tendons or fasciæ are not necessary.

R. S. BROMER.

**Willard, D. P.: Subastragalar Arthrodesis in Lateral Deformity of Paralytic Feet.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

Lateral deformity of the feet in infantile paralysis occurs in the astragaloscaphoid and the astragalocalcaneal joints and not in the ankle. Arthrodesis of these subastragalar joints gives a stable foot for

weight-bearing, does not interfere with ankle motion, does not shorten the leg, and gives a rigid point of attachment for the unparalyzed muscles. In this operation there is no careful dissection of the joint surfaces, instead there is a rough digging and gouging of the articular areas and the bony surfaces between them with no attempt to remove the fragments that are torn loose. Proper fixation of the foot in the proper position after operation is essential. The patient is allowed to walk in a cast at the end of four weeks, and the cast is removed in eight weeks. The operation has been successfully done in six-year-old children. It can be well combined with tendon-transplantation. A report of cases by the author is given.

**Brian, B.: Talipes Equinus Through Myositis of the Triceps** (Pie bot equino per miositis del triceps sural). *Prensa méd.*, Argent., 1916 ii, 354.

The causes which keep the foot in the equinus position are the retraction of the tendo achillis and the malformation of the astragalus.

The retraction and shortening of the tendo achillis was the cause in the case reported by the author in a boy of 17; this kept the foot in a definite position. The surgical indication was therefore apparent, lengthening of the tendon.

The osseous lesions were secondary: flexion of the foot, disappearance of the astragaloid function, and inflexion of the ankle. Astragalectomy was indicated for the correction. Radiology six months after intervention showed firm overriding on the superior face of the os calcis, also the neo-arthritis which is formed and which permits passive and active movement of flexion and extension through an angle of 20°. The plantar impression taken since operation shows the contour of the foot to be normal.

W. A. BRENNAN.

**Young, J. K.: The Etiology of Congenital Absence of Parts.** *Lancet-Clin.*, 1916, cxv, 248.

The author gives some facts bearing on the etiology and pathology of these conditions, some of which he thinks are amenable to treatment.

A case is cited showing various absences of bones and digits and other marked deformities. He rather adheres to the so-called "ray" theory because in this case all of the parts supplied by the rays from a common center were affected. He has also given some favorable consideration to the amniotitis theory where the adhesive band cut off the parts. It is shown that the congenital absence of both upper and lower extremities is rare, and the humerus is most rarely absent while the radius is most frequently found absent. The theories most plausible are:

1. The theory of heredity.
2. Prenatal disease (musculonervous theory).
3. Arrest of development (osseous theory).
4. Mechanical pressure (intra-uterine theory).
5. Amniotic adhesion theory.

His conclusions are that most of the theories are

faulty, illogical, and unsupportable and that most of the congenital absences are due to adhesive bands, and amniotitis being the cause of this and traumatism being the cause of amniotitis gives a fair basis for his hypothesis.

H. W. MALTBY.

**Henderson, M. S.: The Intraperitoneal Inoculation of Animals; Its Diagnostic Value in Orthopedic Surgery.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

The difficulty and uncertainty of the diagnosis in obscure joint lesions may be very materially lessened by employing the simple test of intraperitoneal inoculation of animals, which has been a routine procedure in the orthopedic section of the Mayo Clinic during the last three years in suspected cases of tuberculosis. The results have emphasized the fact that the symptoms produced by tuberculosis of a joint may be very mild. The test has allowed a differentiation in many instances between a diagnosis of infectious arthritis and tuberculosis, which could not have been made with certainty by any other method. For this reason it would seem that it may be more readily employed when it is possible to obtain fluid or material for the test.

Of 143 patients furnishing material there were 40 who gave a positive test. The test is considered positive when miliary abdominal tuberculosis is demonstrated at necropsy of the animal (guinea pigs in this series). By cutting into the spleen and spreading the material from a tubercle on a glass slide, the acid-fast bacilli can be demonstrated by the ordinary carbolfuchsin stain. A somewhat high percentage of negative results in this series of suspected cases can be to a large extent accounted for by the fact that in the early part of the work antiformin was used to rid the fluid or tissue of mixed infection. This solution acts on the tubercle bacilli either to kill or reduce their virulence, and thus the low resistance of the guinea pig is sufficient to overcome them. Since the antiformin solution greatly reduces the value of the test, it should not be used.

**Baetjer, F. H.: Relation of Visceroptosis to Spinal Lesions.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In dealing with the subject the author has classified the position of the gastro-intestinal tract according to the build of the individual. He subdivides the position of the gastro-intestinal tract into three divisions: First, in individuals weighing 150 pounds or more, the stomach is always high up in the abdomen, occupying a transverse position; the pylorus and duodenum lying to the right of the median line and well up under the gall-bladder region. The transverse colon is also well up, lying just beneath the stomach. Second, where the individual weighs in the neighborhood of 120 pounds, the stomach is cowhorn in shape, the greater curvature lying at, or just below, the umbilicus and pylorus and duodenum either in the midline or just to the



right. The transverse colon is slightly prolapsed, lying about two inches above the crest of the ilium. Third, where the individual weighs around 110 pounds, the stomach is of the fishhook variety, the fundus always in the pelvis, lying completely to the left of the midline. The transverse colon is away down in the pelvis.

The author then goes on to show that all of these positions may be perfectly normal, the important thing being whether or not the stomach functions

properly; in other words, as long as the gastro-intestinal tract functions normally the position does not matter.

In analysis of cases in the three classes, the author could trace no connection at all between any spinal twists and strains with the position of the gastro-intestinal tract. The congenital abnormality of the spine did not seem to be confined to any one class, but occurred just as frequently in all of the three classes.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Sever, J. W.: Fracture of the Lumbar Vertebrae and the Transverse Processes; a Report of Four Additional Cases.** *Boston M. & S. J.*, 1916, clxiv, 606.

Sever adds 4 new cases to his previous 7, all due to severe trauma and all diagnosed with the aid of the X-ray. The cases involve: (1) the twelfth dorsal, first and fourth lumbar; (2) the first lumbar; (3) twelfth dorsal, first and second lumbar; (4) a transverse process of four lumbar vertebrae besides the disarticulation of the last rib on the same side. All these cases were without nerve involvement and all will probably improve with ordinary orthopedic treatment.

F. C. KIDNER.

**Peckham, F. E.: Scoliosis.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

The author discusses the true etiology of scoliosis; i.e., the diseases or conditions which produce a softening of the bones and soft structures. Some of these diseases and conditions are: hypothyroidism, rickets, infectious diseases including the toxic diseases (auto), rapid growth, and possibly others. The spinal column as an entity supports the body weight; i.e., the head and trunk. With the bones softened and the ligaments lax, this support yields under the superincumbent body weight. The spine settles and is thus pushed downward into a scoliotic deformity. This is the anatomico-physiological explanation of the mechanics of deformity formation based upon these etiological factors. One case of hypothyroidism is reported treated by the administration of thyroid extract.

For the mechanical treatment a frame is described on which the patient is placed with the body flexed and lying face down. Lateral and rotary pulls are then applied to the spine. Extension on both the head and feet may also be added. In this way the spine may be straightened and a plaster jacket applied. A case is reported showing the improvement obtained under such treatment. Treatment based on the etiology is urged in addition to the mechanical methods.

This paper is only a preliminary report.

**Hammond, R.: Certain Aspects of Injuries of the Lower Spine.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

These cases are roughly classified as (1) those with actual bone injury, such as fracture of the body, transverse process, or spinous process of a vertebra, often associated with a partial luxation of one vertebra on another, or the slipping of an intervertebral disc; (2) cases of severe wrenching or strain, due to partial or complete rupture of ligaments, relaxation of the sacro-iliac or lumbosacral joints, and associated with peri-arthritis, periostitis, and myositis of the structures involved. Only the second class is considered in this paper. Certain anatomical types of spine are more easily disposed to injury than others. Accurate diagnosis is difficult, and the X-ray is inadequate in this particular type of back injury where fracture or similar injury is not demonstrable. These cases are prone to invalidism, are generally not malingerers, and do not respond readily to treatment. One of the trying features is the chronicity of these cases, with attendant mental unrest, which serves to prolong the convalescence. Social workers are of much aid to the physician in following up these cases and inducing them to return for treatment after they have become discouraged.

**Carderelli, A.: Cervical Spondylitis of Doubtful Nature** (*Spondilite cervicale di dubbia natura*). *Riforma med.*, 1916, xxxii, 157.

The author draws attention to a variety of spondylitis with a syndrome which must not be confounded with that described by Struempell and Marie under the name of rhizomelic spondylitis. In this latter disease there is a total ankylosis of the vertebral column and also of the large articulations in the vicinity of the vertebral column. The spinal medulla is not usually involved; neither are the smaller articulations affected.

The spondylitis now referred to has characteristics of its own. It begins with cervical pain, or perhaps the pain is sometimes in a part of the vertebral column other than the neck. The pain is very violent not permitting the least movement, whereas

in ankylosis of the column rigidity does not cause any pain to the patient. The pain usually radiates into other regions or into the upper and lower limbs according to the part of the column affected. The spinal medulla is also usually involved, and there is a slight or even a complete paralysis which may be flaccid or spastic.

This form of spondylitis generally results from rheumatism, tuberculosis, or gout and usually yields to treatment while the malady described by Struempell and Marie, the cause of which is not known, is incurable.

W. A. BRENNAN.

**Le Breton, P.: A Case of Fracture of the Odontoid Process of the Axis.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

The patient, a young man, received a severe contusion of the head and right side of the neck, caused by a horse rolling back on him. The symptoms were severe pain, rigidity of the neck, a "wry neck" position with the head to the left. Paralysis was absent. The spinous processes of the neck described a curve to the left, and the spinous process of the axis projected to the left and below its usual site. The X-rays showed a fracture of the odontoid process at the base, with a subluxation of the axis, and a subluxation at the junction of the third and fourth cervical vertebrae. Manipulation under an anæsthetic was discussed but weight and pulley treatment was tried first. One evening the patient voluntarily reduced the malposition by forcibly wrenching his neck straight. The pain and rigidity disappeared at once, and six months later the patient was in a nearly normal condition.

**Bromer, R. S.: The Syndrome of Coagulation Massive and Xanthochromie Occurring in Tuberculosis of the Cervical Spine.** *Am. J. M. Sc.*, 1916, cli, 378.

A case of cervical tuberculosis in which the diagnosis was obscure in the beginning is described.

The characteristic spinal fluid findings in tuberculosis of the cervical spine are described, both when the disease is not far advanced and when the disease is at its height.

The spinal fluid was examined carefully and its contents is described in some detail. The author, in conclusion, states that the examination of the cerebrospinal fluid will not assure the diagnosis of Pott's disease. He believes it valuable for showing a meningeal invasion and revealing a compression which makes a lumbar cul-de-sac, a closed cavity, where the cerebrospinal fluid stagnates.

C. C. CHATTERTON.

**Marshall, H. W.: Chronic Backache.** *Boston M. & S. J.*, 1916, clxxiv, 591.

The author in a long and interesting article brings before us a panorama of the various causes of backache; fractures, sacro-iliac and sacrolumbar displacements and strains, postural defects, bone deformities, muscle strain both primary and secondary to blood changes, tumors, and various other causes are all mentioned, and most of them illustrated by cases. The various forms of treatment, mechanical, corrective, surgical, physical, drug, dietary, and hygienic are all mentioned and the surgical treatment fully discussed. The object of the article is to urge thorough study of cases with diagnosis by elimination and treatment directed to all phases of the individual case. F. C. KIDNER.

## SURGERY OF THE NERVOUS SYSTEM

**Stopford, J. S. B.: Gunshot Injuries of the Peripheral Nerves; the Syndrome of Compression.** *Lancet*, Lond., 1916, cxc, 718.

Stopford has had an opportunity of examining many examples of injuries to the peripheral nerves occurring in military practice. The clinical progress in a large proportion of these cases may be said to follow one of the four following courses:

1. Improvement seen in the sensory manifestations within a few weeks, followed by restoration of tone and voluntary contraction in the paralyzed muscles, succeeded by complete recovery within four to eight months. The cases following this course are probably examples of physiological division, the missile having passed close to the nerve without any compression of the nerve.

2. No improvement of any form even after four to six months. All of these cases are clinically examples of complete anatomical division, and surgical means alone can procure recovery.

3. Fairly rapid improvements in the sensory or

motor symptoms, or both, up to a point when further progress becomes more tardy but very slowly continues. These are possibly instances of incomplete anatomical division, but the divided fibers regenerate because they are in good apposition, and there is a minimal amount of cicatricial tissue. Surgery cannot accelerate the recovery of this group and the essential point is to differentiate it from the succeeding one.

4. Improvement, which abruptly ceases or is followed by a relapse. This is an important group and contains a considerable number of cases. The relapse is almost invariably due to compression of the nerve by fibrous tissue or callus, necessitating operative interference, and diagnosis from the previous group as soon as possible is of the utmost importance. Early recognition of this group of cases of compression is facilitated by the observation of a definite syndrome noted frequently by Stopford. This syndrome consists of a dissociated type of sensory disturbance; the area in which there is a loss



of sensibility to pain (tested by pin-prick) is greater than that in which the loss to light touch (tested by camel-hair brush) occurs. This syndrome is the reverse of that enunciated by Head, Rivers, and Sherren for injuries of peripheral nerves. It is not present in examination of recent injuries, but only develops after the wound has healed. All the examples of this dissociation which have come to operation show one pathological condition in common; namely, compression of a nerve which is undivided or incompletely divided. ROBERT H. IVY.

**Sharpe, W.: The Operative Treatment of Brachial Plexus Paralysis.** *J. Am. M. Ass.*, 1916, LXVI, 876.

The exposure of the brachial plexus is a much less difficult procedure technically than is commonly believed. Not only is the plexus situated quite superficially from a surgical standpoint, but also the skin incision may be so placed in the supraclavicular space of the posterior triangle of the neck that the large blood-vessels with the vagus and phrenic nerves are all internal to the pathway of approach to the plexus and are usually never seen; the spinal accessory nerve lies far above. Only the external jugular vein, occasionally unimportant superficial nerve filaments of the cervical plexus and the transverse cervical artery and vein are encountered as a rule, and these structures are frequently so placed that they may not require ligation or section. The subclavicular vessels rarely require exposure.

The incision is a transverse one, 4 cm. in length, in a crease of the skin, about 2 cm. above and parallel to the upper margin of the clavicle. It lies in the lower part of the posterior triangular space with the external jugular vein usually as its center point. This vessel is either ligated or retracted, and then by blunt dissection and retraction of the deep cervical fat, sternomastoid and omohyoid muscles, the deep cervical fascia is exposed overlying the plexus and the scalenus muscles. The deep cervical fascia is incised over the plexus until a complete exposure of it is obtained. Normally, the deep cervical fascia is very thin and transparent, so that the underlying plexus, especially the fifth and sixth roots, can be seen glistening through it; but in these cases of injury to the plexus, the deep cervical fascia is thickened, whitish, and non-transparent, owing to the fibrous tissue formation following the oozing of the blood at the time of the nerve tear; naturally, the earlier the operation, the more normal is the appearance of the fascia.

The location and course of the suprascapular nerve should now be ascertained; usually it is embedded in a mass of fibrous tissue, fat and connective tissue just external to the junction of the fifth and sixth nerve-roots, and unless it is carefully dissected out, there is great risk of cutting it unknowingly so that it may be very difficult to find the distal end.

In the hope that the continuity of all of the nerve-roots has not been destroyed anatomically, this mass of constricting fibrous tissue should be care-

fully dissected away, first from the fifth and sixth roots, then from the seventh, and finally from the eighth cervical and first dorsal nerve-roots. It is rare for all of the roots to be torn.

If the nerve-roots are found to be completely torn, their respective stumps should be secured and their fibrous ends resected with a knife by slicing off transversely thin layers until the cross-section of the nerve-root of both the proximal and distal portions reveals the normal distinct nerve-fibers in their bundles within the sheath. Unless this fibrous tissue is removed, even if an inch or more of the nerve-end must be resected, a good result cannot be obtained.

By elevating the shoulder and inclining the head toward the plexus, it is possible to "bridge" gaps in the resected nerve-roots of 3 cm. and even greater without the tension on the nerve-root becoming unduly high. When the separation of the nerve-ends is greater than 3 or 4 cm., it is usually better judgment to unite the ends by one of the methods of "splicing" now used or even "bridging" the gap with several strands of silk in the hope that the nerve-fibers will be thus permitted to grow down to the distal portion of the nerve. Fine black waxed silk is used to suture sheath to sheath, usually three sutures at one-third intervals around the nerve-root. After the suture of the roots has all been "placed," the ends are brought together by approximating the head and shoulder and the sutures are carefully tied. The tissues are carefully washed with warm saline solution, and, if there is no oozing of blood, two or three catgut sutures are used to unite the subcutaneous tissues, and three or four fine silk sutures for the skin. No drain is necessary. A small sterile gauze compress is applied and retained in position by several strips of adhesive plaster, and then the usual gauze dressing is applied. The arm is raised over the head, being made to grasp the opposite ear, if possible, and a gauze bandage with adhesive plaster holds it in position.

The patient operated on for a brachial birth palsy was 14 years of age. The condition improved, but a good arm was not obtained. The children operated on at three months of age have made excellent recoveries. This is due partly to the fact that in them there was not a complete tear of all the roots of the plexus; whereas, in the children operated on at one month of age, the plexus had been practically torn apart in that the arm, hand, or fingers could not be moved at all, and thus the nerve lesion was always a more severe one. About half of the children operated on at one month of age, however, have shown a marked improvement; in four it may be possible to obtain a normal arm. As a rule, however, the children operated on at three months of age have shown a more constant improvement; yet if they had been operated on at one month a greater improvement might have been secured.

The operation itself is not a dangerous one; there have been no deaths in a series of 56 cases.

EDWARD L. CORNELL.

## MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS,  
ABSCESES, ETC.

**Massey, G. B.:** Clinical Study of 329 Cases of Cancer Subjected to Surgical Ionization. *Med. Times.*, 1916, xlv, 100.

The author reports on 329 cases of cancer selected from among 3,000 cases observed in the last 23 years. These cases were subjected to surgical ionization. The method consists of the diffusion of the ions of zinc by an effectively strong direct current from zinc needles, connected with the positive pole and thrust into the edges of the growth, the circuit being completed by a negative electrode in the center of the large growths, or by a negative pad on a distant skin surface in cases of small growths. In the case of the large tumor, an intense action, both ionic and thermic is permitted. In such cases general anæsthesia is necessary but in the small growths local anæsthesia suffices. Secondary hæmorrhage when the tumor mass separates is the danger. This must be eliminated at times by a preliminary ligation of the vessels.

The patients selected presented growths in accessible locations, and were supposed to be free from internal metastases. When regional infective glands were accessible, they were subjected to the same treatment at the time of operation. Of the cases, 44 per cent were freed from the disease after periods varying from 18 years to 6 months, 111 of these having passed the three-year period; 4 per cent of the patients died from hæmorrhage, subsequent to the operation. These occurred in the separation of the growth, principally in the neck and tonsillar region. Of the cases treated 119 were classed as surgically operable, with 105 successes, or 88.2 per cent; 210 were classed as inoperable, mostly recurring after knife operations. This class gave 20 per cent successes. The diagnosis in each case was confirmed by a microscopic examination of the excision.

The author urges earlier diagnosis and treatment as the best method of decreasing the cancer mortality. He thinks cancer is a parasitic protozoan phenomenon.

HARRY G. SLOAN.

**Royster, H. A.:** Sarcomata in Unusual Situations. *N. Y. M. J.*, 1916, ciii, 492.

The author reports six cases in which sarcomata were discovered in unusual situations, either growing from tissue rarely the seat of such growths or exhibiting other characteristics out of the ordinary.

The first case, a fibrosarcoma of the sheaths of the musculospiral and median nerves, occurred in a girl seventeen years of age. The tumors were found on the right upper arm and left wrist, both the size of golf balls. They were hard, movable, and not tender, but accompanied at times by shooting pains.

The second case was a rhabdomyosarcoma of the trapezius in a woman aged twenty-eight years. She presented a flat, ulcerating growth on the upper posterior aspect of the left shoulder covering an area 2 by 2.5 inches.

The third case was a fibrosarcoma of the breast occurring in a woman twenty-nine years old.

The fourth case was a spindle-celled sarcoma of the abdominal wall in a woman aged forty years. Sixteen years previously a small growth appeared under the skin of the abdomen just above the pubes. Four years ago it was removed under local anæsthesia, but promptly recurred. It grew larger and two years ago was again removed, this time under a general anæsthetic. Rapid recurrence took place and again it increased in size. The mass, about the size of a large cocoanut, was situated in the lower mid-abdominal region, raised above the surface and glazed, but not ulcerated. It was attached only to the abdominal wall, was somewhat movable, and showed little tenderness. The tumor was excised widely and deeply down to the sheath of the rectus; the bleeding points were ligated and the wound was closed with some tension. This patient recently reported that there was no sign of the return of the tumor.

The fifth case was a lymphangiosarcoma of the coccygeal region in a woman of seventy years.

The sixth case was a myxosarcoma of the buttock occurring in a colored man, aged twenty-one years. On account of the size of the tumor he was unable to walk, and when he stood without support he fell toward the left from the tumor's weight. It was an inoperable case, but the patient constantly implored that at least a portion of the mass be removed, being perfectly sensible of the risk. The patient's condition became critical on the table and the operation was not completed. He died an hour afterward.

No recurrence was noted in the other five cases.

EDWARD L. CORNELL.

**Fleisher, M. S., and Loeb, L.:** Immune-Reactions Against Tumor-Growth in Animals with Spontaneous Tumors. *J. Med. Research*, 1916, xxxiv, 1.

Although the conditions determining the growth of tumors in experimentally inoculated animals have been studied extensively, as the authors point out, the conditions underlying the growth of tumors in animals with spontaneous tumors are to a great extent as yet unknown. It was the practical interest attaching to such an investigation and its bearings upon human beings affected by cancer that led the authors to carry on this investigation.

The subject was approached from several angles in an exhaustive way, and the following deductions may be made from the author's study:



1. Mice with spontaneous tumors are not so good a soil for the growth of transplantable tumors as normal controls. This, they state, is probably due to secondary conditions connected with the development of spontaneous tumors, as age, and perhaps to effects of tumor-growth on nutrition.

2. Certain mechanisms which inhibit in normal mice the growth of a transplantable tumor have the same effect in mice with spontaneous tumors, and one of these mechanisms may perhaps consist in the production of certain immune substances.

3. In confirmation of the authors' previous results they found that autotransplantation of spontaneous tumors succeeds in the large majority of cases, while a successful homoiotransplantation into normal mice is much more rare. The growth energy of the successfully transplanted tumors, they state, is approximately the same in the control-mice as in the mice in which the tumor originated, and the increase in growth energy after transplantation is to a great extent due to mechanical stimulation of the tumor during the process of transplantation. Those spontaneous tumors can on the whole most readily be transplanted, they declare, which show the greatest potential growth energy.

4. Further investigations confirm their previous conclusion that mice with spontaneous tumors afford a better soil for the growth of the ordinary spontaneous, otherwise not readily transplantable tumors, than normal control-mice.

5. Spontaneous tumors grow best in animals in which they originated as a result of two factors:

(a) Certain specific conditions present in an animal in which a tumor originated are more favorable to tumor growth than those present in normal mice, with or without transplanted tumors.

(b) The identity of the body fluids which surround the tumor-cells before and after transplantation and the specific adaptation between tumor-cells and body fluids.

6. In animals with spontaneous tumors as well as in normal control animals, the extirpation of a transplanted tumor makes clear the presence of immune substances or of immune mechanisms which had been produced through the growth of the transplanted tumor. A spontaneous tumor, therefore, the authors declare, does not prevent the production of immune substances or immune mechanisms.

7. After extirpation of spontaneous tumors, substances or mechanisms which seriously antagonize the growth of an ordinary transplantable tumor or of the autotransplanted spontaneous tumor, they state, are not demonstrable. Spontaneous tumors, in contradistinction to transplanted tumors, do not produce in any considerable quantity immune substances comparable to those produced by the ordinary transplanted tumor; neither do spontaneous tumors neutralize immune substances produced through the growth of transplantable tumors.

GEORGE E. BEILBY.

## De Tarnowsky, G.: The Modern Treatment of Burns. *J. Cutan. Dis.*, 1916, xxxiv, 191.

Active antiseptic agents have no place in the present-day treatment of burns. They should be used only in the cleansing of the surrounding intact skin. The burn itself should be left alone as far as cleansing is concerned except for the removal of gross dirt. The method advocated by the author as first-aid treatment is to smear vaseline over the burned area until medical aid arrives.

The treatment of a first-degree burn is either open-air treatment or protective dressings. The first can be applied as a rule only in the hospital and gives excellent results. The dressing for ambulatory cases is a protective ointment made up of equal parts of zinc oxide and cold cream ointments with one-half drachm white precipitate to the ounce. This ointment is smeared on gauze and applied to the burn, being left in place as long as possible, 8, 10, or 12 days, without changing. The only indication for changing dressings in a first-degree burn is the presence of pain or temperature. The presence of pain may indicate blebs under tension which necessitate evacuation, and fever indicates infection which necessitates repeated dressing.

Open-air treatment is especially useful in connection with extensive burns in the hospital. A dusting powder of stearate of zinc or bismuth is applied to the burnt surfaces. All sheets should be sterile.

In burns of the second degree the tactile corpuscles are exposed and great pain is experienced, so early covering of these end-bulbs is necessary. In exposed locations or near joints early grafting gives both the best cosmetic and functional results. In parts which are not exposed and are remote from joints, connective-tissue healing, though slower than grafting, gives good results and is permissible. To effect connective-tissue healing a protective covering is advantageous. The author recommends amniotic grafts to act as a protective covering, or in lieu of this substance the following protective ointment may be used: White precipitate of mercury, 1 drachm; white wax, 0.5 ounce; zinc ointment, 1.5 ounces. This ointment is impregnated into gauze and the prepared gauze kept in sterile jars for future use.

The treatment of third-degree burns may exercise the ingenuity of the surgeon to the extreme in the formation of proper flaps, lengthening of tendons, etc., but no detailed description of this degree of burns is taken up in this paper. J. H. SKILES.

## SERA, VACCINES, AND FERMENTS

### Hoskins, R. G.: Action of Pituitary Extract. *J. Am. M. Ass.*, 1916, lxi, 733.

The effect of intravenous injections of extracts of the pituitary gland on the intact small intestine was investigated. Dogs were anaesthetized and the dorsal portion of the spinal cord destroyed. A segment of the intestine was immobilized (Trendelenburg technique), and a recording lever was

attached. In five cases out of six a clean-cut depression of tonus and peristalsis occurred. Commercial "pituirrin" was the extract used. In three instances saline extracts of old preparations of desiccated gland gave similar results.

The possibility is suggested that it may be correlated with some recent change in the process of preparing the extracts for market. In any case, each lot of the product should be tested by the manufacturer and its effect on peristalsis stated on the label of the container. EDWARD L. CORNELL.

### BLOOD

**Evans, F. A.: Observations on the Origin and Status of the So-called Transitional White Blood-Cell.** *Arch. Int. Med.*, 1916, xvii, 1.

Because of the uncertain origin and status of the so-called "transitional" cell which has always existed, the author in the hope of shedding some light on this obscure subject was led to make the observations contained in this paper concerning an unusual transitional cell reaction which he observed after the administration of salvarsan.

The patient was a male, aged 29, who was admitted to the hospital complaining of shortness of breath. A clinical diagnosis was made of luetic aortitis with aortic regurgitation and moderate hypertrophy of the heart. Wassermann test was positive. Salvarsan, 0.45 gm., was administered intravenously. There was a very marked reaction following the administration of salvarsan and evidences of certain changes in the blood, such as jaundice, epistaxis, bleeding from the mucous membranes, etc., with the reduction of the red blood-cells and hæmoglobin, and in addition the reaction was manifested by unusual changes in the white blood-cell picture. There was a decrease in the polymorphonuclear cells with an increase in the transitional cells. This transitional reaction was not then or later accompanied by any immature cells of the polymorphonuclear system. Subsequent sharp polymorphonuclear leucocytosis associated with a few myelocytes was almost without influence on the number of transitionals. The transitional cells, in contrast to those of lymphoid and endothelial origin and in common with those of known myeloid origin, contained oxydase granules in great abundance after formaldehyde fixation and with alkaline solution of the reagents.

There were no transition stages between any lymphocyte, large or small, and the transitional cell, and the specific stimulation of the transitionals did not influence the number of true lymphocytes in the blood.

Although one type of large mononuclear cell bore a striking morphological resemblance to the transitional, only the latter was increased under the stimulation which occurred, and the total number of those cells going to make up the large mononuclear group was uninfluenced by the transitional reaction.

While realizing that no definite statements can

be made from the data afforded by a single case, in view of the unique opportunity offered in this particular case for study of the transitional cell the author feels that the observations made strongly suggest the following conclusions:

1. That the so-called transitional cell is not an immature or degenerated form of any other cell type, but is an independent cell type in itself.
2. That the productive center of the transitional cell is closely related to that of the polymorphonuclear system, but is independent of it.
3. That the transitional is not an endothelial cell, bears no relation to the lymphocytes large or small, and is probably of myeloid origin.
4. That the one distinct type of large mononuclear closely resembling the transitional should probably be included with it to form an independent cell type; but that if there is any difference in the age of the cells of oval or indented nuclei, as seems likely, the cell with the indented nucleus—the typical transitional—should be considered the younger.

GEORGE E. BEILBY.

**Rowan, J. J., Jr.: The Practical Application of Blood-Pressure Findings.** *J. Am. M. Ass.*, 1916, lxvi, 873.

Blood-pressure readings, as often made, are practically worthless. Frequently, even the systolic pressure findings are incorrectly taken as, for instance, when the compression bag of the instrument is placed about the arm over the sleeve.

In a series of experimental observations, to ascertain the increase of pressure required to obliterate the vessel with the bag over the sleeve of a garment, the mercury column registered a systolic pressure of from 10 to 30 mm. of mercury higher than on the bare arm.

Another source of inaccuracy is the use of the palpation method of estimating pressures. In a series of 100 experimental examinations, the column invariably stood from 5 to 10 mm. higher with the stethoscope than with the tips of the fingers.

This paper is based on the results obtained in 500 recorded findings from a series of examinations made during the last two years. The systolic pressure findings are of much less importance than either the diastolic or pressure pulse records.

Generally speaking, its only real value is in those cases in which the diastolic pressure is known to be high, as in the course of a chronic interstitial nephritis, especially after arterial degenerative changes have occurred, and as an index to the probable condition of the diastolic pressure and the pressure pulse, or as an aid in arriving at a prognosis. Its diagnostic value is practically nil.

#### AVERAGE BLOOD-PRESSURES

Age	Number of Examinations	Blood-pressure, mm.		
		Diastolic	Systolic	Pressure Pulse
From 20 to 30	50	81	125	44
From 30 to 40	72	86	142	55
From 40 to 50	210	89	156	61
From 50 to 60	168	88	183	94



A considerable proportion of the readings were made from patients with abnormally high pressures. Violent physical exercise produces high systolic pressure by means of cardiac hypertrophy.

EDWARD L. CORNELL.

**Minot, R. G., Denny, G. P., and Davis, D.: Prothrombin and Antithrombin Factors in the Coagulation of Blood.** *Arch. Int. Med.*, 1916, xvii, 101.

The authors have studied the blood in various diseases with reference especially to the content in antithrombin with the hope that they could say definitely that there are leading cases due to an increased amount of antithrombin and others due to a diminished amount of prothrombin and that diminished amounts of antithrombin occur only in cases subject to or having thrombosis. A consideration of these tests and normal variations of the factors and findings in the various pathological conditions from the basis of this paper.

The authors describe the manner of making the various tests and record their results in detail. They make the following summary and conclusions:

1. Prothrombin time, tested by the method used, varies normally from six to fourteen minutes.

2. The technique and difficulties of the antithrombin test have been described.

3. The antithrombin factor is the most satisfactory method for the comparison of amounts of antithrombin.

4. Antithrombin varies normally. The antithrombin factor must be below 0.55 and above 1.81 before one can be absolutely sure that the amounts are abnormal; one may be reasonably sure that the amounts are abnormal if the factors are below 0.68 or above 1.47.

5. In some cases a prolonged prothrombin time may be explained by a corresponding increase of antithrombin and a shortened prothrombin time by a decrease. There are cases which suggest that the available supply of prothrombin in the blood may undergo wide variations in disease independent of the antithrombin content. Certain cases of bleeding and of jaundice, also hæmophilia, as well as others, seem to have a diminished supply of prothrombin. Actual increase of prothrombin does occur, as is indicated in a case of aleukæmic leukaemia, and in some animals as compared to the human being. Relative increase is shown in a number of cases, especially thrombosis and some leukaemias.

6. The prothrombin time does not always vary with the platelet count.

7. Cases exist in which more calcium than usual is needed to obtain the prothrombin time.

8. The amount of fibrinogen in human blood probably does not vary sufficiently to alter appreciably the prothrombin time.

9. A positive increase of antithrombin is indicated in three cases. A relative excess is suggested in some cases in which the prothrombin is apparently

diminished. Diminution in antithrombin was especially found in cases of severe typhoid fever, certain leukaemias and anæmias, and thrombosis, and in some cases associated with a low fibrinogen content.

10. Cases of spontaneous bleeding occurred with normal coagulation factors. Others showed a low prothrombin, usually, but now always, associated with a relatively high antithrombin. The three patients with a very high antithrombin studied by the authors, all bled.

GEORGE E. BEILBY.

**Cumming, J. G., and Chambers, J. S.: Tissue Cellular Protein Poisons.** *J. Lab. & Clin. Med.*, 1916, i, 428.

Cumming and Chambers refer to the fact that Vaughan's protein poison has previously been derived only from pathogenic and non-pathogenic bacteria, from proteins of the vegetable world, and from albumins or globulins. In this paper they show that this protein poison can also be extracted from the tissue-cells of exsanguinated organs of multicellular organisms. They experimented with the tissues, including muscle, brain, heart, lung, liver, pancreas, and kidney, which they obtained from the dog, goat, ox, and rabbit. Inasmuch as protein poison can be obtained from blood constituents, the authors thoroughly removed all blood before clotting had occurred thus securing organs free from water soluble protein.

Vaughan's standard procedure for splitting off the poison was made use of, and the conclusions are:

1. Vaughan's protein poison can be prepared from tissue-cells of the exsanguinated organs of multicellular animals.

2. The tissue-cell protein poisons are not only toxic for heterologous species, but also for homologous species.

3. The minimum lethal dose of the protein poisons — here reported — for the guinea pig and the rabbit is in proportion to their relative body weights when given by the intraperitoneal method of injection; when given intravenously, however, it is, in proportion to body weight, twenty-five times more toxic for the guinea pig than the rabbit.

4. Tissue cellular protein poison hastens the clotting of blood from the guinea-pig, rabbit, and dog *in vivo*. The protein poison prepared from casein differs from these in that it either retards or prevents entirely the clotting of dog's blood.

5. Witte's peptone does not prevent the clotting of rabbit's blood *in vitro*.

6. The *in vitro* experiments reported show that all the protein poisons tested inhibit the clotting of blood from the guinea pig, rabbit, and dog in certain percentages.

GEORGE E. BEILBY.

**Kahn, A.: Continuous Transfusion in the Production of Immunity.** *Med. Rec.*, 1916, lxxxix, 553.

The author presents a tabulated list of thirty experiments carried out on dogs, to see the effect

of continuous transfusion or swapping of blood upon an animal whose peritoneum had been previously infected.

The animal, under ether anæsthesia, was laparotomized, infected material (gauze covered with pus) introduced, and the wound closed tight.

In twenty-four hours, the donor was chosen and the external jugular vein exposed throughout the neck. The infected dog was similarly treated. The animals were then turned head to head; the external jugular vein cut in the middle and the distal end of the vein of dog A sutured to the cardiac end of the vein of dog B; the other two ends were then united and all clamps removed. In some instances, this continual blood-swapping was kept up for over an hour.

The conclusions are as follows:

Continuous transfusion is experimentally successful between dogs for periods varying from one-half to three hours. The experimenter believes that he succeeded in raising the vital resistance in many instances, while he is in doubt as to the production of immunity.

The advantage claimed for this method is that the transfusion can be kept up for an indefinite period between several subjects, if desired, with a minimum loss of blood to each animal.

LUCIAN H. LANDRY.

#### BLOOD AND LYMPH VESSELS

**Dyas, F. G.: Treatment of Femoral Aneurism.** *Surg., Gynec. & Obst.*, 1916, xxii, 493.

The time of operation is essential to the successful result of the procedure, time being permitted when possible for collateral circulation to be established. Rest in bed is necessary during the period of waiting for the retardation of the growth of the aneurism. If the aneurism be situated above the origin of the profunda femoris the condition is greatly complicated. If it be below, however, there is a good chance to preserve the limb. Plastic work for femoral aneurism is difficult because of the situation and high blood-pressure. These lesions are practically always caused by trauma in contradistinction to their formation elsewhere as a result of specific infection or high blood-pressure.

Gunshot wounds are the commonest cause of femoral aneurism. The dissecting type in these instances rapidly forms large tumors raising up the muscles of the thigh. Treatment should be by double ligation above and below and by a partial removal of the sac. Two months elapsed between the date of operation and the time of operation in the case reported and the ultimate result was good.

**Moncalvi, L.: Lacing the Lingual Artery for Secondary Hæmorrhage of the Tongue** (*Allacciatura dell' arteria linguale per emorragia secondaria della lingua*). *Policlin.*, Roma, 1916, xxiii, sez. prat., 273.

In severe traumatic hæmorrhage of the tongue hæmostasis obtained by early intervention may

save the patient's life. However, such a hæmorrhage is infrequent, not because traumatic lesions of the tongue are rare but because it is unusual for hæmorrhage occurring with or consecutive to such a lesion to assume such proportions that it calls for operative measures. The reason is that such lesions mostly involve the margin or the anterior third of the organ in which the vascular branches are relatively few. And even in the middle third where the arterial branches are thicker and hæmorrhage may be severe, it is always susceptible of spontaneous arrest. It is only in profound traumatic lesions involving the posterior part of the tongue that hæmorrhage may be of such magnitude as to endanger the patient's life.

The author considers that ligation of the lingual artery is an operation which is not easy of execution in such circumstances and that moreover it is accompanied by more or less danger. Tampons and the use of the thermocautery are likewise not efficient. In a case reported by the author a workman owing to an industrial accident suffered a severe injury to his entire tongue. Five or six days later the wound was septic and necrotic and the secondary hæmorrhage was so severe that urgent operative measures were demanded. The author decided that lacing of the lingual artery at a distance was the only practical method under the circumstances and this was carried out. The hæmorrhage immediately ceased and the patient recovered, there being no bad effects eleven months later.

The author counsels lacing of the artery at a distance in all cases where urgent intervention is called for as it is easier of execution, less dangerous than ligation, and gives satisfactory results.

W. A. BRENNAN.

**Torrey, J. C.: Bacteria Associated with Certain Types of Abnormal Lymph-Glands.** *J. Med. Research*, 1916, xxiv, 65.

This investigation was undertaken mainly for the purpose of controlling the work of Negri and Mieremet and that of Bunting and Yates, with reference to the causative agent in Hodgkin's disease. The author undertook a cultural study of such Hodgkin's material as he could obtain and also of abnormal glands from other diseased conditions, his purpose being to determine the frequency with which diphtheroids are present in such conditions and whether they could be referred to as a distinct type within this large bacterial group.

The glands which form the basis of this study were, with one or two exceptions, obtained through surgical operations, and the material was studied by cultural methods and by animal inoculation.

In the course of the study the author points out that aerobic diphtheroids of one type or another were isolated from four of ten typical cases of Hodgkin's disease, but in only two instances did he find them of the pleomorphic granular type which has been claimed by Negri and Mieremet and also



by Bunting and Yates to stand in etiological relationship to that disease, so that as a result of the work presented here, and also the evidence that Torrey was able to gather from other investigators, he comes to the conclusion that the theory of a casual relationship between a diphtheroid and Hodgkin's disease rests at present upon an insecure basis.

GEORGE E. BEILBY.

**Horsley, J. S.: Reversal of the Circulation in the Lower Extremity.** *Ann. Surg.*, Phila., 1916, lxiii, 277.

The therapeutic value of attempts to reverse the circulation in the extremities has been widely discussed ever since Carrel and Guthrie published the results of their experiments in 1906. The author undertook a series of experiments on animals to determine whether the arterial blood when switched into the vein reached the ultimate capillaries. The cardiac end of the femoral artery of the dog was united to the distal end of the femoral vein by an end-to-end suture. The dogs were killed at intervals varying from a half hour to sixty-nine days. The results of the experiments upon all except the last animal were published in 1915. In this last animal a cinnabar and bismuth mass was injected into the femoral artery about an inch above the point of anastomosis. The artery was tied and roentgenograms taken. The systemic arterial circulation was then injected through the carotid with bismuth mass and a roentgenogram taken.

From the roentgenograms it is evident that the circulation goes but little farther down the leg of the dog in sixty-nine days than it does the first half hour after the circulation has been reversed; that is, only a little below the knee. The author concludes that the beneficial results obtained by the reversal of the circulation in an extremity in threatened gangrene are due to the fact that obstruction of venous circulation causes the arterial blood to remain longer in the tissues than it otherwise would. The same result can be obtained more accurately and with much less danger by ligation of the femoral under local anæsthesia.

GATEWOOD.

## POISONS

**Smyth, H. F.: The Reactions Between Bacteria and Animal Tissues Under Conditions of Artificial Cultivation; Bactericidal Action in Tissue Cultures.** *J. Exp. Med.*, 1916, xxiii, 265, 275, 283.

The author has previously reported investigations on the reactions which occurred when tissue cultures *in vitro* were inoculated with living pathogenic bacteria, and in this article he records his further observations on the subject which confirm those of the former papers and strengthen the conclusions drawn therefrom. The results may be summarized as follows:

Chicken plasma has a marked bactericidal action on bacillus typhosus, which may be in some slight

degree overcome by the presence of growing tissue, especially splenic tissue, in the cultures.

On bacillus dysenteriae this bactericidal action of chicken plasma is present, but much less marked, and the same counteracting action of tissue, especially splenic tissue, is evident.

On bacillus coli versus chicken plasma has little or no bactericidal action.

On bacterium diphtheriticum chicken plasma has a very strong bactericidal action which may be strongly counteracted by the presence of growing tissue in the cultures.

In all cases the bactericidal action of the plasma is decidedly diminished by dilution, as shown by the comparative results of these and the cultures formerly reported.

The migrating white cells from splenic cultures, or substances closely associated with these cells, have a distinctly bactericidal influence on all organisms tested, except bacillus coli versus. Murphy states that lymphocytes first appear in the general circulation of the chick embryo on the eighteenth to twentieth day, but in the author's cultures of splenic tissue, cells resembling lymphocytes in morphology and behavior begin to appear in cultures of 11- or 12-day spleen and are abundant in cultures of spleen from 14-day or older embryos.

While studying the action of pathogenic bacteria on chick embryo tissues cultivated *in vitro*, the author was impressed by the apparent stimulation of the cultures inoculated with bacillus typhosus when the bacilli themselves failed to develop. To determine if this was an actual stimulation of growth or merely an accidental condition in the few cultures he had tested, heavy vaccines, or suspensions of killed organisms, were prepared and used for diluting the plasma for tissue cultures, thus allowing the use of many more bacilli per tissue culture than could be used with living organisms.

His results seem to indicate that many bacteria may be utilized by tissue-cells as food for growth or may contain a substance or substances stimulating cell growth or multiplication. This substance he declares is stable and is not destroyed by heating to 100° C. or by long standing. With micrococcus aureus he found that this action was often neutralized or overcome by a substance inhibitory to growth.

The nature of these substances, he states, has not yet been determined, though several attempts along this line were made by endeavoring to split the typhoid bacterial substance according to the method of Vaughan and testing the poisonous and non-poisonous residues separately. However, at the time too little bacterial substance was used to obtain enough end-products to be of much use, and the products so obtained prevented the plasma from coagulating. Even in the uncoagulated plasma there appeared to be an increase of cells in the cultures with the non-poisonous residue. The author hopes to be able to repeat these tests with split products at a later time when more bacterial

substance is available, with the hope of obtaining more definite results.

The results obtained from the study of the reaction between various pathogenic bacteria and animal cells under conditions of artificial cultivation according to the method of Burrows led the author to undertake during the early part of 1915 the study of the action of human tubercle bacilli with chick embryo tissues cultivated in chicken plasma. Two strains of bacilli were employed in his work, one freshly isolated by the author from human sputum, using Petroff's egg-beef-juice-gentian-violet medium, and one obtained from the laboratories of the H. K. Mulford Co., a "Baldwin" bacillus used by them for preparing tuberculin.

In plasma cultures, with or without tissue, he found that tubercle bacilli formed characteristic streptothrix-like colonies of loosely twisted skeins of threads.

In plasma tissue cultures embryonal connective tissue and epithelial cells were found to phagocytose tubercle bacilli freely.

Splenic tissue cultures from fourteen-day or older embryos if inoculated with isolated bacilli, he states, will phagocytose and prevent the development of all or nearly all bacilli present. The author concludes his study as follows:

In plasma tissue cultures *in vitro* with tissue containing lymphatic elements the changes characteristic of early tubercle formation may be seen when such cultures contain masses of tubercle bacilli: (1) clustering of lymphocytes about bacilli; (2) clustering of epithelioid cells and other polynuclear or polymorphonuclear cells with multiplication of nuclei in the epithelioid cells; (3) fusion of epithelioid cells to form giant cells; and (4) degeneration of cells containing bacilli.

GEORGE E. BEILBY.

**Ullman, J. S.: Anthrax; Report of Cases.** *Surg., Gynec. & Obst.*, 1916, xxii, 450.

Anthrax is transmitted to man by handling an infected animal or its excreta; or it is transmitted from the hide, hair, or other portions of an infected carcass. There are three avenues of infection: the skin, intestines, and rarely, the lungs.

The external lesion, at the site of infection, is usually preceded by an itching and burning, and there may be a small papule resembling that caused by the bite of a flea. After a short interval (rarely more than three days), the papule increases rapidly in size, and a dark discoloration appears at the summit. At this point a vesicle appears, which may sometimes contain a bloody serum. Bacilli are early present in the lesion. The vesicle ruptures spontaneously and a dark crust forms in the center of the lesion. This is the beginning of the necrotic process, which gradually spreads. The surrounding tissues are oedematous.

The symptoms are chill, fever, malaise, weakness, occasional vomiting. Intestinal or pulmonary types cause symptoms due to disease of these organs.

As to diagnosis, the occupation of the patient is

significant. Identification of the bacilli in the lesion confirms the diagnosis. Ascolin has devised a precipitin reaction.

The only rational treatment so far reported is with specific serum, that of Sclavo ranging from 40 to 150 ccm. with good results.

The author, not being able to obtain a serum on the market, bled a horse that had been recently immunized against anthrax, and prepared a serum from the blood. The first patient was practically moribund when the serum was administered. Two others, in whom the symptoms appeared, promptly recovered upon the administration of 50 ccm. It is advised that from 50 to 250 ccm. be given intravenously in severe cases.

**Speed, K.: Post-operative Tetanus.** *Surg., Gynec. & Obst.*, 1916, xxii, 443.

The presence of tetanus organisms in the dejecta of animals and in about 5 per cent of all humans has been proved. Carnivora as a rule have a relative immunity. The experimental work on the disposition and effects of tetanus toxin introduced into the alimentary tract of animals is reviewed. The various digestive juices and the bacterial growth of the large bowel destroy large doses of toxin without untoward effect on the animal. Tetanus organisms may be carried in the blood stream. They have been found in nerves, brain, lymphatic glands, and blood of fatal cases in man. Animals may become tetanus carriers.

The biologic requirements of tetanic infections are described. The spores and their toxin are necessary for the development of the disease in animals, and in man auxiliary infections, usually of pyogenic organisms, are required to establish tetanus. Experiments citing these facts are quoted. The forms of non-traumatic tetanus are enumerated as follows:

1. Cryptogenetic or rheumatic tetanus.
2. Tetanus after skin lesions — mechanical, bacterial, and thermic.
3. Tetanus from the respiratory and digestive tracts.
4. Tetanus after injections.
5. Tetanus after vaccination.
6. Tetanus after operation.

Attention is directed to tetanus following elective operations which are classed as clean. The avenues of infection are:

1. The operator's hands.
2. The instruments, dressings, and ligatures.
3. Air infections.
4. The patient himself.

Post-operative cases have occurred after all types of operations, formerly more frequently in gynecologic surgery, but they still occur sporadically in aseptic surgery.

The question of the possibility of catgut infection is discussed and the conclusion reached that it is not a carrier of tetanus infection. Bruising and handling of the bowel which permits an emanation of the tetanus bacilli from the lumen probably



causes the post-operative cases following laparotomy. Six cases are cited.

The necessity for abstinence on the part of the patient from green vegetables and other uncooked tetanus spore-bearing foods for several days before operation coupled with a free catharsis in accordance with Matas' advice is emphasized.

The theory is advanced, however, that some individuals are tetanus carriers and that these are responsible for many of the constantly occurring post-operative cases.

### SURGICAL ANATOMY

**Troell, A.: Some Attempts to Produce Exophthalmos Experimentally.** *Arch. Int. Med.*, 1916, xvii, 382.

In a previous paper the author published the results of a number of clinical and experimental observations on the pathogenesis of the eye symptoms in exophthalmic goiter. At that time he dwelt particularly on Landstrom's explanation of their origin, and the result of his experiments led him to the belief that Landstrom's theory of the production of eye symptoms in exophthalmic goiter was not a correct one.

Troell, therefore, in this present paper records the results of his experiments to produce exophthalmos by the use of toxic materials, in some cases without any preparatory measures; in others, after having removed the superior cervical sympathetic ganglion on one side.

His explanation of this method was that if it should be found that exophthalmos failed to appear on the side on which the interruption had been made in the sympathetic, this would be proof that the co-operation of the sympathetic was necessary for the production of such exophthalmos. He, therefore, made use of other toxins than those of the thyroid gland in carrying on his experiments. The one which he found most satisfactory was  $\beta$ -tetrahydronaphthylamine for the reason that it had a direct affinity with the sympathetic nervous system. His experiments were carried out on a great variety of animals and the results are recorded in a series of carefully prepared tables.

Considered together his results show that whenever exophthalmos proceeded from the assumption of co-operation through sympathetic stimulation, they were negative, but that in that group of cases in which paraphenylendiamine injections were made they were positive, even when the co-operation of the sympathetic had been eliminated. He seems thus to have proven that exophthalmos, not resulting from an intra-orbital tumor or some such cause, may arise without any intermediation of the cervical sympathetic.

In conclusion the author states: "On the whole, the question of the genesis of exophthalmos in exophthalmic goiter remains unsolved. It must seem all the more desirable that we should acquire a thorough understanding of it, now that we have

arrived at a more complete recognition of the importance of distinguishing clearly, both in diagnosis and prognosis, between the syndrome of clinical and pathologic anatomic phenomena which we roughly speak of as exophthalmic goiter."

GEORGE E. BEILBY.

**Brancati, R.: Experimental Alterations Produced by the Micrococcus Melitensis** (Sulle alterazioni sperimentali da micrococco meliteuse). *Policlin.*, Roma, 1916, xxiii, sez. chir., 65.

The affections produced by the micrococcus melitensis are multiple in character. They may be manifested by continuous or remittent fever; by disturbances in the gastro-enteric tract; by nervous phenomena; by hypertrophy of the liver and spleen. Sometimes the local manifestations are such as to pass into the region of operative intervention. Thus, various authors have reported cholecystitis, suppurative parotitis, epididymitis, phlebitis, etc., as due to this organism.

The author has made a number of animal experiments to find the exact effects due to the microbe. In rabbits injections were made in the marginal veins of the ears, of a melitococcus emulsion in physiologic solution; or else a muscle was incised and deposits of the microbe placed there. In guinea pigs additional endovenous injections were made.

The author gives the details of eight groups of such animal experiments and describes the changes found in the muscles, liver, spleen, medulla, etc. These results show in general the fact that lesions provoked locally by the artificial deposits of cultures of micrococcus melitensis vary from small nodules consisting of lymphocytes, eosinophiles, and endothelium to that of large collections of puriform substance. In these can be found all the regressive phases of the elements which occur in exudations of this infective process, due to the passage of the microbe from a distant point. The effects are principally seen in the liver, while in all other organs examined, the initial stages of hyperplasia of the lymphocytic and eosinophile elements contained in them remains, or there is only a simple hyperæmia.

W. A. BRENNAN.

**Macht, D. I.: Pharmacology of the Ureter; Action of Epinephrin, Ergotoxin, and Nicotine.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 155.

The author makes the following summary:

1. The effect of drugs on the ureter was studied by the use of longitudinal strips and rings of the ureters of pigs and oxen.

2. When kept in Locke's solution on ice the ureter retains its vitality for three days.

3. A ureteral ring preparation suspended in warm oxygenated urea Locke, exhibits spontaneous rhythmic contractions, thus affording a convenient means of studying the effect of drugs on ureteral tonus and peristalsis.

4. Epinephrin increases the rate of ureteral con-

tractions and the tonus of the ureter; larger doses inducing a condition of tonic spasm or tetanus.

5. The action of epinephrin is reversed after previous administration of ergotoxin.

6. The effect of nicotine upon the ureter is a primary stimulation and secondary paralysis, and is a strong corroboration of the existence of ganglion cells.

7. The same results were obtained with the human ureter from a case of nephrectomy. J. H. SKILES.

### RADIOLOGY

**Kelly, H. A.: Some Radium Achievements.** *Am. J. Surg.*, 1916, xxx, 73.

Kelly claims that radium cures skin epitheliomata, especially those about the face, in over 90 per cent of cases when seen early.

When the disease extends on to and involves the mucous membrane of the nose or mouth or when it extends back of the ear and becomes adherent to the mastoid, although there may be marked improvement, the final results are not nearly so good. Of the mastoid group he has not yet seen a single cured case.

Cancer of the lip, if taken early, can often be eradicated; late cases are difficult to handle. He presents a case, however, which was treated and apparently cured. Where the glands of the neck are involved they ought to be removed surgically. Of cancer of the tongue he has had several apparent cures, but all were early cases.

Of 20 cases of lymphosarcomata, 13 had been operated upon; all were advanced cases and most of them desperate risks, with one exception, yet 65 per cent gained entire relief. Kelly does not believe that surgery is justifiable any longer in this group, for here surgery is at its worst with its practically invariable recurrences, and radium is at its best with its rapid dramatic cures.

Of 213 cases of cancer of the cervix uteri treated by Kelly between January 1, 1909, and January 1, 1915, 14 were operable and 199 inoperable or inoperable recurrent cases. Of the 14 operable cases 10 were operated upon and treated prophylactically with radium. Of these 2 have remained well for more than three years; 1 for more than two years; 4 for more than one year; and 3 for more than six months. In 4 cases of the operable group, on account of some general contra-indication to operation, radium alone was used. All of this group are living and well; 2 for more than three years and 2 for more than one year.

The total number of inoperable and inoperable recurrent cases is 199, of which 53 patients have been clinically cured, 109 markedly improved and 37 not improved. The series includes 35 cases of originally inoperable cancers of the cervix uteri or vagina in which the patients are clinically cured: 2 cases for more than three years; 4 cases for more than two years; 17 cases for more than one year; 10 cases for more than six months. It also includes 18 cases of

originally inoperable recurrent cancers in which the patients are now clinically cured: in 1 case for more than six years; in 1 case for more than four years; in 11 cases for more than two years; in 10 cases for more than one year; in 5 cases for more than six months.

Excluding the 10 operable cases in which he both operated and used radium, there are 203 cases left; in 57 of these 203 cases the patients are clinically cured. Of the 57 clinical cures, 1 has lasted for six years, 3 for more than four years; 4 for more than three years; 5 for more than two years; 24 for more than one year; 15 for more than six months.

From this experience, Kelly formulates the following rules:

1. Operate on every operable case, estimated as a good risk, as heretofore.

2. Radiate from four to six weeks after the operation.

3. Do not operate on borderline cases, but use radium first, for the disease practically always returns after operation in these cases, while many are curable with radium.

4. Radiate all the advanced inoperable cases, for many of these too are curable, or can be shrunk so as to become good risks.

5. Where there are metastases up into the abdomen, radiation may give great relief and a temporary return to apparent good health, but it will not cure.

DAVID R. BOWEN.

**Bythell, W. J. S.: Radiography of the Chest in Children.** *Arch. Radiol. & Electrotherap.*, 1916, xx, 321.

The author lays stress on the great value of fluoroscopic examination, which, in his opinion, will in the great majority of cases, make a plate examination unnecessary for a diagnosis. Aside from the examination of the lungs proper, he emphasizes the value of the X-ray in the diagnosis of spinal abscesses associated with caries of the vertebrae, and the determination of congenital or acquired stricture and diverticulum of the oesophagus. In the examination of the lungs, the author is of the opinion that an experienced observer should be able to see, in children up to twelve years of age, on the screen, practically everything in the thorax that can be seen on a plate. He dwells on the value of the Coolidge tube for this purpose.

In the writer's experience, the origin of tuberculosis in children, in practically every case, is at the root of the lungs. This may result in a calcification of the bronchial lymph-nodes, or the latter may caseate, and extending to the neighboring tissues, produce a tuberculous bronchopneumonia at the hilus. The shadows thus produced are blurred or mottled, differing from the streaky, linear shadows which may be seen in cases of chronic bronchitis.

Healed lesions are more opaque and of sharper definition than active ones. The author here, however, emphasizes the necessity for invoking the



clinical data in finally determining the activity of the lesion.

Apical disease is exceptional in young children; if present, changes will usually be found elsewhere in the lungs.

The shadows produced by acute bronchopneumonia do not differ from those of tuberculous disease.

HARRY WESSLER.

**Holmes, G. W.:** *The Roentgenoscopic Examination of the Stomach and Duodenum; a Report Based on the Findings in 730 Cases Examined During the Year 1914.* Boston M. & S. J., 1916, clxxiv, 531.

The expense incident to the usual roentgen examination of the gastro-intestinal canal being prohibitive in hospital clinics, the author endeavors to show that the results obtainable by a careful roentgenoscopic study are as good as those obtained by the more costly methods. In analyzing 730 cases thus observed for stomach and duodenal lesions, he confines himself to drawing definite conclusions only in those cases where the roentgen findings have been checked up by operative procedures. In gastric ulcer, malignant disease, adhesions, and duodenal ulcer his findings were verified in over 87.8 per cent of the cases; in negative cases, gall-bladder lesions, and chronic appendicitis the percentage of correct findings, though less, still comprised a majority of those examined.

Regarding the nature of the findings, in gastric and duodenal ulcer and malignant disease, filling defects, abnormal peristalsis, and residues in varying degrees were present in all but a few of the cases. In gall-bladder lesions, chronic appendicitis, adhesions, and negative cases, abnormal peristalsis was the most evident, residues and filling defects being less so.

Where doubt as to malignancy existed, the author inclined toward pronouncing the cases positive, believing that less harm would result from error in that direction than otherwise. He also maintains that the roentgen examination can replace exploratory operation in those advanced cases where findings typical of extensive lesions are present, but no stasis exists.

The technique used differed but slightly from that commonly employed. Stress is laid on maintaining constant factors, if reliance is to be placed on comparative data. As a result of the above study, the author has come to the conclusion that his method offers the best chance of obtaining correct roentgen findings with the least cost, and in hospital clinics it is the method of choice. A. HARTUNG.

### MILITARY SURGERY

**Flesch, M.:** *Gunshot Retention Wounds* (Ueber steckschuesse). *Beitr. z. klin. Chir.*, 1916, xcvi, 400.

Generally gunshot injuries in which part of the projectile remains lodged are of two kinds, large and small, differing, however, very much in char-

acter from each other. The large variety is principally characterized by the very much larger size of the entrance wound and the tearing of the skin and fascia. In the other class are placed all those injuries in which only small particles of the projectile are found to be embedded. In this class of injuries the enormous penetrability of these small masses is of particular interest.

In diagnosing retained particles and ascertaining their depth, the author has had great success with the Fuerstenau procedure. Extraction must follow the anatomic routes.

W. A. BRENNAN.

**Delorme, E.:** *Gunshot Wounds in the Upper Limbs.* *Practitioner*, Lond., 1916, xcvi, 261.

The author gives an interesting discussion of gunshot wounds of the upper limbs, with an explanation of their treatment and complications. Injury of the phalangeal bones demands support of the injured finger by a splint or by strapping it to the neighboring sound finger. In this way displacement laterally or by flexion will be prevented. The general characteristics of the wound will depend on the angle at which it strikes the hand. Communication of the bones is more prone to follow when the projectile strikes either the ulnar or radial surfaces of the hand. Conservation is the keynote in the treatment of all wounds of the hand. The removal of adherent splinters of bone is to be avoided. Loose splinters collected around the point of exit are better removed. Loss of substance in a metacarpal bone causes a shortening, with the result that the flexion folds of the finger do not correspond with those of its neighbors, so that there is difficulty in grasping objects. It is better to splint all fractures of the hand than to depend on the immobilization that is given by bandage alone. Inflammatory infection of the tendon-sheaths requires immediate incision. The author recommends a palmar incision even when the redness of swelling may be most prominent on the dorsum, because of the fact that the pus is found in the deep palmar structures. He advocates the starting of the palmar incision at the junction of the thenar and hypothenar eminences, then running it either along the axis of the index by way of the palmar M or by the median palmar incision, which starts from the same point and runs to the interdigital space between the index and middle finger, or by the internal incision, which starts from the same point and follows the edge of the hypothenar eminence toward the little finger. He does not advocate cutting across the radiocarpal ligament.

Scar formation in gunshot wounds of the hands is likely to be followed by contraction deformities and serious loss of power. Deep thickened painful scars should be excised. Such scars may be largely avoided if the edges of the wound are brought together as soon as granulation tissue appears. He advocates passive motion carried out by the surgeon rather than by the patient. When the tendons are attended by adherent scar masses, it is best to



dissect them free, and by wrapping them in adipose tissue or catgut prevent the formation of new adhesions. Divided tendons are best sutured. The author has observed that the distal ends of the flexure and extensor tendons almost invariably correspond with the metacarpophalangeal joints. The proximal ends of the extensor tendons scarcely go beyond the level of the midcarpal space. Those of the flexure tendons are of varying levels. The two ends are usually connected by scar tissue, which is usually diffuse, hard, and blackened. Grafting of tendons seems to give the best results where there is lack of substance. A neighboring tendon is used to supply the graft. Amputation of stiff and deformed fingers is called for only after unsuccessful reparative operations. The wounds of the hands due to self-mutilation are usually found to have entrance at the palm, with an extremely shattered condition of the tissues surrounding the wound on the dorsum. Tissues blackened by the grains of powder may be recognized microscopically.

Wounds of the wrist demand conservation pure and simple, suppuration to be simply drained by the classical incisions. Foci of chronic osteitis are curetted, chiefly by use of the lateral incisions. Every effort should be made to prevent sacrifice of bone in case of the radius or ulna alone, because of the serious and irremedial lateral displacement of the hand following. The author advocates passive movements of the fingers from the first in wounds of the wrist, with a splint that will immobilize the wrist at the same time. Early mobilization of the wrist cuts short any stiffness.

Wounds of the forearm are best treated by reducing the size of the wounds by strips of adhesive plaster as soon as granulation appears. It is wise to keep the arm in a position opposed to that which the contraction of the scar will cause. Any removal of splinters from the radius or ulna brings with it the probability of a pseudo-arthritis which is very difficult to deal with. Grafting of bone where there has been loss of substance with infection has not been very promising, because of the lack of nutrition in the bed of scar tissue which the graft must occupy. The object of all treatment of simple fracture of the forearm is to preserve the dimensions of the interosseous space. They should be put up in supination.

Wounds of the elbow have their chief practical interest in connection with their soft parts, viz., their arteries and nerves, whether these are injured by projectiles or enclosed by callus. Lesions of the articular extremity of the humerus are generally confined to the part struck, provided that the site of impact is below a horizontal line drawn from the epicondyle to the epitrochlea. Injuries above this point are characterized by large splintering of the bone. He advocates thorough disinfection at first with early immobilization by an apparatus which leaves the elbow exposed for drainage. Infected elbow-joints are best drained by a posterolateral incision. Amputation should be resorted

to only in the case of irreparable damage. Ankylosis is a fairly frequent sequel to injuries of the elbow-joint. The occupation of the man should be borne in mind when ankylosis is expected, and the arm be placed in a position that will be most serviceable to the patient afterward. Resections of the elbow-joint have not given as useful arms as ankylosed joints in good position.

Stiffness in the elbow must be combated over long periods of time by graduated exercises or mobilization under anæsthesia. In elbow injuries the triceps is often atrophied, and there may be danger of flexion occurring if in the interval this muscle is not electrically stimulated.

Wounds of the arm are simpler to treat. Attempts should be made to reduce the size of the wound by adhesive strapping as soon as granulations occur. The author calls attention to the danger of wounding the median nerve in operations for arteriovenous aneurisms because of the position of the nerve and its change in color, which makes it difficult to recognize. Cut nerves are sutured. Where there has been a loss of substance, the ends are grafted by means of a piece taken from the distal fragment, and wrapped in fat or catgut to prevent adhesions. Loss of substance in the humerus is readily accommodated by the shortening action of the muscles. Pseudo-arthritis is rare. Simple apposition in a trough or angular splint gives better results than continuous extension. In suppuration drains are to be avoided.

The common shoulder wounds are simple perforations from front to back, usually with not much splintering of the bone, and when there is, these splinters are large and adherent and therefore amenable to treatment. Gunshot wounds of the surgical neck cause splitting of the humerus below into two large fragments while the head of the bone remains undamaged and forms the third fragment. Shoulder injuries demand conservation pure and simple. In infection of the shoulder-joint, an early deltoid incision is indicated. It is best made along the line of division between the deltoid and pectoral muscles. Sometimes it is necessary to remove the almost freed head of the humerus because of prolonged suppuration. Amputation at the shoulder-joint should be performed only under the most exceptional circumstances, as an artificial arm is of little practical use. Mobilization of a stiff shoulder is best accomplished by traction by weights in the direction of abduction. When the patient stands facing the apparatus the arm is carried forward, and when he turns his back the arm is carried behind him. Mobilization is completed by exercise on bars. HARRY G. SLOAN.

**Bruns, P. von: Treatment of Wounds in War** (Zur Wundbehandlung in Kriege). *Beitr. z. klin. Chir.*, 1915, xcvi, 1.

In reviewing data sent to the author by colleagues in the field and in the hospitals with reference to



points already discussed in connection with wound treatment, the point is emphasized that in general infected wounds are not caused by small arms but are due to artillery. Koerte refers to the dangers of transporting the wounded. He has seen cases where wounds which nine and ten days after the injury were painless and without fever, after a few hours in a transport again became suppurative with recurrence of fever. He advises that wounds be left wide open; loosely tamponed to allow easy drainage of secretions; frequently and carefully bandaged; and the injured limb supported. The general opinion among surgeons is that the battle against infection must be carried on by means of antiseptics, but that treatment must be chiefly mechanical until an ideal antiseptic can be found.

The author reports on Wrights' hypertonic salt solution, the procedures of Whitehouse and Delbet, but especially on the treatment worked out by Dakin and Carrel, which he thinks should be applied at the earliest possible time, injected every one to two hours and into all recesses. In this way complete sterilization may be effected.

W. A. BRENNAN.

#### SURGICAL PATHOLOGY

**Kennedy, J. W.: A Plea for Practical Methods in Diagnosis.** *Med. Council*, 1916, xxi, 37.

This ultrascientific age has brought forth much that is of extreme and vital interest to our profession, but the author questions whether we are not forgetting many of the most valuable lessons of our past masters.

As much as it may seem uncomplimentary to a progressive age, the author questions whether or not the young graduate of this day is as good a diagnostician, from the clinical standpoint, as was the equally young graduate of a quarter of a century ago. Neither medicine nor surgery is an exact science and those ultrascientific means of recognizing disease have not yet compensated for the loss of interest and knowledge which may be derived from a careful study of clinical history, physical signs, and symptoms.

Exploratory incision may have a place as a means of obtaining knowledge in abdominal conditions, but it is abused beyond human endurance and is causing an atrophy of reliable means of investigation.

No teacher can advance his ideas without being in contact with the particular case; all other operators are merely surgical carpenters and are known more from the great number of cases operated upon than from any real progress they have given the profession. Experience is said to be a worthy teacher, but experience does not necessarily mean the handling of a great number of cases. Refined and masterful surgical judgment comes from crystallized experience and not necessarily from quantity of material.

We must have more interest shown in the young

men. The author feels that the operator who is commanding a large clinic which is surrounded by a number of bright, eager young physicians who are not permitted under the instructions of the surgeon in command to do a large per cent of charity work, is a parasite upon the profession and has outlived his day of usefulness. On the young surgeon rests the future of the profession and under these circumstances he is not getting his dues.

During the author's twelve years' association with as conspicuous a gynecologist as the world has ever known, he has never seen a case in which hysterotomy was indicated for diagnostic purposes. Hysterotomy has its place in surgery, but never from the standpoint of diagnosis. One certainly would not want to open the uterus if it were pregnant, and one certainly would not want to cut into its fundus if it were malignant, where hysterotomy was indicated, the incision being made as far from the malignant zone as possible. No surgeon with gynecological judgment would open the uterus for retention of blood, pus, or water. The surgeon who opens the uterus to remove submucous or intermural fibroids will find, in nearly every case, that after he has removed all tumors in sight, he has left a greater number of small growths. Myomectomy, even in the hands of the gynecologist, is of limited use and questionable merit. Certainly the general surgeon is not attempting to ask the gynecologist to reverse his curettage, open the fundus of the uterus, ignoring a patulous cervix, while the infected contents of the uterus are removed through the abdomen. Hysterotomy for diagnostic purposes is the wildest of all the surgical brain-storms to date. All exploratory incisions should be therapeutic in termination.

When an operator says that he has had so many thousand operations and such and such is his opinion, that cannot be taken as final; he may have started wrong and been wrong ever since.

EDWARD L. CORNELL.

**Nakano, H.: The Value of Various Diagnostic Methods for the Cerebrospinal Fluid.** *J. Cutan. Dis.*, 1916, xxxiv, 179.

The author reports a series of cases upon which the various laboratory tests were performed. His conclusions are as follows:

1. The Wassermann reaction in the spinal fluid in late syphilis, as well as in cerebrospinal lues, tabes dorsalis, and dementia paralytica rapidly disappears, but the serum remains for a long period.
2. The substance causing the complement fixation in the spinal fluid probably enters the fluid from the blood, but it has not yet been determined whether the antibody of this reaction is produced in the fluid itself.
3. The Nonne-Apel't reaction frequently appears in the cerebral and spinal diseases.
4. The Weil-Kafka reaction appears in acute and chronic inflammations in cerebrospinal and



meningeal diseases (lues, general paralysis, tabes dorsalis, and acute meningitis).

5. The Lange reaction appears in almost all cerebral and spinal diseases. The nature of the Lange reaction is closely connected with the presence of globulin and nucleoprotein in the fluid. It is very difficult to determine the difference between lues and other diseases. But in cases which have been proclaimed to be luetic by other diagnostic methods, the Lange reaction may be used to determine the early involvement of the nervous system of a syphilitic patient, since it is more sensitive than other reactions.

6. The Nonne-Apelt, Wassermann, Weil-Kafka, and Lange reactions disappear by degrees under treatment with salvarsan, mercury, and iodine.

J. H. SKILES.

**Duval, P.: Operative Technique of the Extraction of Projectiles Under Guidance of the Hirtz Compass** (Technique opératoire de l'extraction des projectiles sous la direction du compas de Hirtz). *Rev. de chir.*, Par., 1916, xxxv, 1.

The author thinks that of all localizers the Hirtz instrument is unquestionably the best and the surest; but that it is necessary for the operator to be versed in its use. The employment of the instrument necessitates numerous precautions, and the apparent failures of the method are in reality failures in its employment by the radiographer or surgeon.

The author in collaboration with Bécélère has made about 90 extractions of projectiles with the Hirtz localizer, and has had no failures. The particular technique to be followed for different regions is described and illustrated.

W. A. BRENNAN.

#### HOSPITAL, MEDICOLEGAL, MEDICAL EDUCATION

**Breaking of Stitches and Opening of Wound Not Covered by Accident Insurance.** (*Stokely vs. Fidelity & Casualty Co. of New York (Ala.)*, 69 So. R. 64.) *J. Am. M. Ass.*, 1916, lvi, 836.

While the case cited of *Stokely vs. Fidelity & Casualty Co.*, reported in the 69th Southern Reports, p. 64, is not a malpractice suit it will be of interest to the profession because of the finding of the Court that the breaking of stitches following an operation and causing death is not an accident within the meaning of the clause in an insurance policy insuring against death by accidental means.

The beneficiary of an accident insurance policy brought suit against the Fidelity & Casualty Co. for the alleged accidental death of the insured. The plaintiff's case was predicated upon the following facts which are taken from the Court's review of the evidence. The insured was operated upon for appendicitis and for four or five days thereafter his condition was indicative of a rapid recovery. On the morning of the fifth day he had a coughing spell and complained of pain. Upon examination it was found that the stitches of the wound had broken and the intestines were protruding through the

opened wound. The patient was anesthetized and the intestines replaced and the wound closed. The patient never regained consciousness and died a few hours following this operation. The reviewing court held that the death of the insured was not caused by an accident which would render the defendant insurance company liable under the terms of its policy. The policy stating that it insured against "bodily injury sustained . . . through accidental means . . . and resulting directly, independently, and exclusively of all other causes . . . in death." The court explains its reason for its affirmance of the judgment in favor of the defendant company in the following manner; that the breaking of the stitches was not an accident causing bodily injury and death; it was merely the failure of the means employed to prevent death threatened by other causes.

The death which followed was undeniably and in a most material way contributed to, if not exclusively caused by, the disease with which the insured was afflicted and the means taken for his relief. The surgeon testified that in his opinion the patient would have recovered from the operation had not the stitches broken, but the Court was of the opinion that the terms of the policy were such that there was no liability.

J. A. CASTAGNINO.

**Degree of Skill and Care Required.** *Med. Rec.*, 1916, lxxxix, 474.

The case of *Pace vs. Cochran* in the 86 S. E. 934 discusses the degree of care and skill required by a physician and surgeon. The civil code of Georgia lays down the rule that: "A person professing to practice surgery or administer medicine for compensation must bring to the exercise of his profession a reasonable degree of care and skill. Any injury resulting from the want of such care and skill will be a tort for which recovery can be had." This is the standard in Georgia by which an action for malpractice in that state is tested. In determining the question of reasonable care and skill the jury may consider the place of operation and all the attendant facts and circumstances which may be shown by the evidence. Expert evidence should be introduced then to show the usual and customary method of performing operations, such as the consent in question, which should be considered along with the other testimony bearing upon the case.

The Supreme Court then discusses the use of the word "approved" for instructions to the jury and states that the use of the word "approved" might be misleading to the jury as to its meaning and as to whom the "approval" should be made by. The Court then refers to "Taylor's Medical Jurisprudence," and states that a surgeon should keep up to the latest advances in medical science and use the latest and most improved methods and appliances having regard to the general practice of the profession in the locality where he practices.

This case is one that fairly illustrates the position



of the law in regard to malpractice not only in Georgia but in practically every state in the Union.

A physician operating is bound by the same rules as laid down and practically the same rules of evidence as in other cases and the average physician or the general practitioner is held to have and to exercise an average or reasonable degree of skill and care. A specialist, however, in his particular line is held to a higher degree of care. The degree of care to which a surgeon or physician is held would be the same degree of care and skill customarily used and exercised by a physician and surgeon under the same conditions and in the same locality.

J. A. CASTAGNINO.

**Lupton: Roentgen-Ray Plates May be Shown to Juries.** *J. Am. M. Ass.*, 1916, lxvi, 982.

One of the points raised by the defendant on appeal in a case where the plaintiff had recovered damages for personal injuries alleged to have been sustained by having his foot run over was that it was wrong to permit a physician to exhibit to the jury roentgen-ray plates taken of the plaintiff's foot. The court in discussing this stated that there was no exception taken to the description of the injury as disclosed by the plates; that the only exception made was to the exhibition of the plates to the jury; and that as there was nothing to show any variance between the plates and the description of the injury aforesaid, that even if the exhibition of the said plates was erroneous it would be harmless. The court then proceeded to show that the question has been raised before in the presentation of ordinary photographs, which, when shown to be true representations and taken under certain conditions, are admissible, and that the same rule applied to photographs taken with the use of the roentgen-ray.

J. A. CASTAGNINO.

**Locher, R. W.: Inguinal Hernia Viewed from a Present-day Medicolegal Aspect.** *Bull. Med. & Chir. Fac. Md.*, 1916, viii, 180.

The relationship between an individual's occupation and the true etiology of hernia has been the subject of controversy for many years, yet never before has the profession been called upon to give a more strict account of its knowledge of this phase of the subject than at the present time. Within the past few years the legislatures of quite a number of states have enacted laws holding corporations and employers legally and finally responsible for traumatism to their employees. Occupying a position of considerable prominence on the list of traumas is hernia and it frequently devolves upon the doctor to determine whether or not a certain individual's occupation was at fault in the production of a particular hernia.

Whether or not the sac is developed from a congenital defect, such as a small funicular process, or whether it is of the true acquired variety, there is

one conspicuous fact common to both, namely, that the sac is the terminal result of a gradual process of stretching, covering a considerable period of time, and not the result of a single sudden strain or effort. The peritoneum possesses considerable elasticity and can be stretched gradually to almost any limit, but any single effort strong enough to produce protrusions of viscera, such as are encountered in herniæ, instead of stretching the peritoneum, must necessarily rupture it. That rupture of the peritoneal coat does not occur we are well aware, so as a natural sequence its presence as a hernial sac is due to a gradual stretching.

With few exceptions every sufferer from hernia attributes his rupture to some particular strain or accident. If his occupation requires even the most modest of muscular effort, it is no trouble to cite some certain occasion when his rupture must have occurred. As a rule, this is not done intentionally, but from the fact that it is the common belief among the laity and the profession that rupture is commonly the result of accident or strain. Due to ignorance of the true facts concerning hernia, this ignorant and totally incorrect impression has been allowed to exist among the laity almost unchallenged, but the time is now at hand when it is the duty of every physician not only to acquaint himself with the facts about herniæ, but to rectify the existing misunderstanding among his patients on every occasion where opportunity presents.

EDWARD L. CORNELL.

**Interpretation of Physicians' Liability Contract.**

*Seay vs. Georgia Life Ins. Co.*, 179 S. W. R., 312.

The above case may prove of interest to surgeons who indemnify themselves against suits for malpractice because of the many technicalities of the policies which they carry. The plaintiff in the above suit was indemnified in the above company and carried what is known as a physician's liability policy. Prior to the institution of the above suit, the plaintiff had been sued by a patient who had been injured in an accident and who was attended by one of the plaintiff's assistants. The patient succeeded in recovering a judgment against Doctor Seay amounting to \$1,000.00 and costs. The suit under discussion was brought by the doctor to recover this amount from the insurance company under the terms of the policy which it issued to Doctor Seay. A clause in this policy was that it undertook to indemnify Doctor Seay "against loss from the liability imposed by law upon the assured for damages and on account of bodily injury or death suffered by any person or persons in consequence of any alleged error, or mistake, or malpractice by any assistant in the employ of the assured while acting under assured's instructions." In the malpractice suit against Doctor Seay the following facts were brought out by the testimony: That the assistant undertook to diagnose the injuries of the patient, proceeded to treat him and in so doing was acting under the general directions

and within the scope of his employment although the employer, Doctor Seay, did not see the patient at the time, gave the patient no personal instructions or attention, and apparently had no knowledge of the particular case. The defense of the insurance company in the case under discussion was predicated solely upon the clause in its policy which is quoted *supra*, its contention being that the assistant in his treatment of the patient in question was not acting under the assured's instructions within the meaning of the policy and that therefore the company was not liable for the expenses and judgment of that trial. The plaintiff contended that the assistant was acting in the line of his employment according to general instructions and custom which prevailed between himself and Doctor Seay. Should the court hold that an assistant acting under general instructions and within the scope of his employment was acting under "assured's instructions," the purpose as defined in the policy within the qualifications attempted would entirely fail. However, in a physician's contract such as this one, the experience and ability of the individual insured necessarily enter largely into the consideration. As a safeguard against error, mistake, malpractice, or carelessness of the assistant, the insurer stipulates for the instructions of the insured, and following this line of reasoning the reviewing court stated in substance that therefore it could not be held liable for any mistake, negligence, malpractice, or carelessness of the assured's assistant while acting under the general instructions of the assured but without any advice or directions from the assured in the particular case, the policy being without provision as to the qualifications of the assistant. From a professional standpoint, the assistant was acting independently and without the suggestion, aid, or supervision of Doctor Seay. The finding of the court was that the insurance company was not

liable upon its policy and the finding was in its favor.

It might be well to add for the benefit of physicians and surgeons who indemnify themselves against the liability which the law imposes upon their acts, that the holders of this form of policy of insurance should note the many technicalities with which the insurance companies who write this form of insurance fortify themselves so as to make this form of policy a beneficial one to the company from a stockholder's point of view. The writer has a number of cases in mind where the insurance company, after accepting premiums, disclaimed liability and under the technical provisions and limitations of their policies were enabled to successfully defend and defeat any suit brought against them at a later date for the recovery of costs and expenses incurred by the policyholder in defending himself against a suit for malpractice. We would suggest, therefore, that the holder of a policy of this character, read carefully all the provisions of his policy and bear them well in mind. Malpractice suits against physicians and surgeons have been increasing in the last ten years to such an extent that they now form no inconsiderable portion of the suits filed in the courts. From the foregoing, the writer does not mean to convey the impression that physicians and surgeons are negligent. The increase is probably due to the fact that the profession has now reached such a high standard that the patient feels that failure to cure is evidence of negligence and attempts to seek relief via the pocket-book of the attending physician or surgeon. Judge William H. Taft, in a decision which he rendered while on the bench, stated that if the foregoing were the law "few would be courageous enough to practice the healing art, for they would have to assume financial responsibility for all the ills that flesh is heir to."

J. A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Boldt, H. J.: Discission and Adjustment of an Intra-uterine Stem Versus Dilatation to Overcome Stenosis of the Cervical Canal.** *J. Am. M. Ass.*, 1916, lxvi, 1000.

Is cervical dilatation really the best means of giving permanent relief? The question must be answered negatively, since it will be found in many cases that within from two to four months the cervical canal has again become constricted. There is, however, a method of intervention which will positively obviate this. Cervical discission with adjustment of an intra-uterine stem will give such guarantee.

With the patient in the lithotomy position, the cervix, having been exposed with vaginal retractors, is drawn down and steadied with bullet forceps. A Simpson hysterotome is used. The cervical canal should not be dilated before the operation lest it confuse the operator as to the extent of the discission advisable.

The discission is made on the anterior and posterior surfaces of the interior of the cervix. When the discission has been made, a hard rubber intra-uterine stem is adjusted. EDWARD L. CORNELL.

**Seeley, W. F.: The Primary and End-Results in Inoperable Cancer of the Cervix Treated by the Cautery Method.** *J. Mich. St. M. Soc.*, 1916, xv, 169.

Seeley reports 49 cases treated with the Percy method in the last two years and nine months. Of these, 37 were cauterized once, 10 were cauterized twice, one was cauterized 3 times, and one 5 times. The chief indications were: foul discharge, hæmorrhage, and pain in the order named, in cases with too extensive involvement to permit of pan-hysterectomy. The post-operative history is usually uneventful; occasionally the temperature rises to 103°; there is little pain. The resulting slough is negligible if the cautery irons are not too hot. Marked improvement in the patient's condition is noticeable: the hæmoglobin rises 10 to 25 points; there is a gain in weight; hæmorrhage, pain, and discharge cease; and by the time the patient is discharged the cervix and uterus are contracted and covered with fresh scar tissue.

The post-operative histories of 23 patients are collected. Of the series, 15 are dead and 8 living. Of those who died, 1 lived 19 months; 1 lived 11 months; 1 lived 10 months; 8 lived 4 to 8 months; 4 lived less than 4 months. F. W. HEWITT.

**Watkins, T. J.: Prophylaxis of Uterine Cancer.** *Surg., Gynec. & Obst.*, 1916, xxii, 442.

There are no means of determining that cancer has or has not been prevented. This paper must con-

sequently deal with probable or possible means of prevention of cancer of the uterus.

The fact that cancer occurs in women who have not borne children and occasionally in virgins, that it frequently begins in the glands of the cervix far distant from the vaginal portion and at times does not extend to the vaginal surface until late in the disease, are proofs at least that there is no constant relation between traumatism of the cervix and cancer.

From the meager knowledge which we have of cancer, it must be inferred that the irritation and circulatory disturbances resulting from traumatism can be the only possible contributing factors in the development of cancer of the cervix, and that traumatisms of the cervix are not a frequent contributing cause of cancer.

Erosions of the cervix are commonly neglected. An erosion of the cervix should receive attention for the same reasons that abraded surfaces in other parts of the body should be treated. It has become a habit to neglect them. They are probably most important as points of focal infection, but may be etiologic factors in cancer, as is an erosion of the lip, tongue, nipple, etc. Many cases of erosion are amenable to medical treatment. The more extensive ones, with deep lacerations, extensive erosions, and glandular degenerations, require operative treatment. The operation in the bad cases that will probably not have future pregnancies should be high amputation, including most of the glands in the cervix.

Hæmorrhage occurring after the menopause has been established for some time should as a rule indicate hysterectomy. Hæmorrhage at that time should be considered evidence of the presence of cancer. If cancer is not found the operation is justified as a prophylactic measure. Cancer is the common cause of bleeding from a uterus that has become senile and atrophic. Fewer mistakes in diagnosis are made by considering all of this group cancer than by the use of other known means for diagnosis in individual cases. This has been the author's practice for some years and the results have been highly satisfactory.

Incisions into and curetting of cancers should usually be avoided. Bloodgood's study of cases would indicate the great importance of immediate operation after incision into cancerous tissue.

Morris H. Richardson strongly advocates the removal of all tumors as a prophylaxis of cancer. This principle of treatment, the author believes, should apply to uterine tumors. All uterine tumors should be removed as a prophylaxis of cancer, irrespective of other indications.

**Case, J. T.: The Roentgen Treatment of Uterine Carcinoma.** *Surg., Gynec. & Obst.*, 1916, xxii, 429.

Assuming that there is no disagreement as to the successful application of the roentgen method in the treatment of superficial cervical epithelioma, this paper is confined to an inquiry into the value of present-day deep roentgentherapy in uterine cancer which has advanced beyond the stage of superficial epithelioma. By newer methods, the author refers to more powerful apparatus, improved filtration, improved technique of irradiation, cross-fire, near focus-skin distance, etc., and the use of the Coolidge tube. These various developments have rendered possible the effective employment of doses aggregating at least one hundred times the maximum dose considered safe ten years ago. Warning is given, however, that this increase in the value of the method has been accompanied by a corresponding increase in the danger attending its use. Greater skill and judgment is now required. Insufficient irradiation is likely to produce more active growth through irritation, instead of the intended destruction. Without adequate filtration the treatment is worse than useless.

Emphasis is laid upon the growing value of roentgentherapy as a palliative treatment. Some clinical cures are reported, but a sufficient percentage of apparent cures lasting three or more years has not been obtained so that at the present time we are not justified in claiming for the X-ray or radium a permanent curative value. Nevertheless, the destruction of cancer-cells in the uterus has been demonstrated histologically by various reliable investigators. There is a tendency for connective-tissue new-growth to replace the destroyed carcinomatous cells. Typical cases are cited, with the histological findings. Since the possibility of cure has thus been demonstrated, we must not be too discouraged, although our experiences to date do not include any permanent cures. The question of permanency of cure can not be known until after the lapse of eight or ten years. As yet we are not justified in substituting roentgentherapy for operation in any operable cases.

Post-operative roentgenization is urged in all cases of malignancy. This treatment should be applied as soon after the operation as possible and as thoroughly as though the disease were still present in its entirety, the patient's sole prospect of cure resting on radium, and roentgentherapy.

**Pfender, C. A.: Indications for Surgery or Deep Roentgentherapy for Myomata and Metropathies.** *Med. Rec.*, 1916, lxxxix, 596.

Pfender makes a strong plea for deep roentgentherapy in uterine fibroids as well as in climacteric or preclimacteric metrorrhagia. He cites his own cases and those of other observers to show the good results obtained by radiation. The growth

of the fibroids is either arrested, or complete atrophy of the tumor occurs.

The decrease in the volume of the myoma occurs in one or two ways: (1) through the ovaries, analogous to the shrinking during the climacteric or after the surgical removal of the ovaries, or (2) by a direct selective action on the tumor-cells.

In treating young women the effect of the X-ray on the ovule with subsequent sterilization must be borne in mind.

Preclimacteric metropathies are treated with brilliant results, and it may become possible to bring about amenorrhœa in every case, regardless of age.

Roentgentherapy is efficient and much safer than surgery in the majority of uterine fibroids. It is especially valuable in cases accompanied by marked anæmia, myocarditis, renal or any other disease which would endanger the patient's life if subjected to surgery. The contra-indications to roentgentherapy are: (1) malignancy or suspicion thereof; (2) large tumors causing severe pressure symptoms; (3) submucous myomata; (4) suppurative or degenerative myomata; (5) cases in which the diagnosis of myomata cannot be made with certainty; (6) adnexal complications, such as salpingitis or similar inflammatory processes.

L. R. GOLDSMITH.

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Salatic, P. B.: Technique by Which Conservatism is Made Possible in Diseases of the Adnexa.** *Am. J. Surg.*, 1916, xxx, 90.

With the idea of treating the adnexa conservatively, the author uses the following technique:

With the use of sponges arranged flat at the end of two or more sponge-holders, the different structures can be separated with the greatest care and the least amount of traumatism. One can always see what he is doing and the fingers are not constantly in the cavity. This diminishes to a minimum the risk of entering a hollow viscus.

One or more sponge-holders are used to separate the organs so as to find the adhesions. Generally there is some adhesion which can be severed either with a sharp scalpel or with scissors that cut well on the ends. In cutting these adhesions in this manner, the area of raw surfaces is diminished and the bowel is less likely to be torn into, necessitating drainage and rendering attempts at conservatism almost futile. The adherent bowels having been carefully separated, the position and condition of the adnexa are studied. If pus is suspected, they are gently packed off with dry or moist sponges. The tubes and ovaries are saved where possible. If the frimbriated end is closed, the author resects that portion. A case of badly adherent tubes and cystic ovaries is reported. Partial resection of one tube and ovary was performed. The patient has been pregnant twice since the operation.

EDWARD L. CORNELL.



## EXTERNAL GENITALIA

**Quinby, W. C.:** A Case of Pseudohermaphroditism, with Remarks on Abnormal Function of the Endocrine Glands. *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 50.

The case was that of a patient, 10 years old, whose parents were first cousins. The patient had been classed as a boy. His habits and activities were those of a normal boy; he spurned girlish pursuits and much preferred such games as football. The pubic and axillary hair had been present for four years. The voice had always been "coarse" and the hands and feet "stubby." Since birth the urethra had opened at the base of the penis and the testes had not descended. There was an entire absence of any history of abdominal pain or crises suggestive of retained menses and there had never been any bleeding from the penis. Libido had not appeared as yet.

On physical examination the general bodily condition and color were found to be excellent. The musculature was well developed. The head was rather large, with prominent frontal regions, and the shoulders, though broad, were markedly stooping. The forehead was of moderate height; the face broad; the lips thick; the nose flat. The hair, dark brown in color, was rather coarse and was lacking over each lateral frontal region. The eyebrows were more sparse in their outer portions than toward the root of the nose. The eyes, ears, and mouth were normal. The ears showed no stigmata and the upper central incisors were no broader than the other incisor teeth. The palate was moderately high. There was a considerable amount of fine hair on the upper lip; the axillary and pubic hair was abundant, the latter showing the female type of distribution. The hands were broad and short, the finger-nails had been bitten. The skin over the body was somewhat harsh. There were no abnormal deposits of fat. On examination, the heart, lungs, and abdomen were found to be entirely normal. The breasts were undeveloped and of the male type. Very careful palpation showed no sign of any abnormal abdominal mass. There was no unnatural pigmentation of the skin. The growth of hair below the knee on each leg was in marked excess.

On examination of the genitalia, the phallus was found to be represented by an organ 5 cm. long, curved markedly toward its ventral surface. There was a well-developed prepuce, drawn into folds on the dorsum, but not uniting completely in the midline on the ventral side. This covered the glans, which was well developed except for the meatus, which was replaced by a ventral groove. At the base of this structure, between it and the slightly prominent mons, the skin rose in a fold and, encircling the phallus, extended downward on either side to form the bifid scrotum or labia majora. No testes or spermatic cords were to be felt anywhere. When the glans was drawn upward, the opening of the urethra was seen at a point corresponding to the

penoscrotal junction. From this to the tip of the glans the middle line showed a longitudinal gutter covered by striæ of mucosa. The perineum from meatus to anus was smooth and without trace of depression. There was nothing to suggest labia minora.

Rectal examination showed an apparent absence of the prostate, although in the region above this area there was felt a small mass about 2 cm. long and 1 cm. broad, not tender and only slightly movable.

At operation no trace of a spermatic cord could be found in the inguinal canal. On entering the abdomen, an infantile uterus with tubes and ovaries of normal appearance was found. An ovary, with an adjoining portion of its tube, was excised for histological examination.

It is evident that this was a case of atypical senescent, more commonly, though less correctly, called pseudohermaphroditism. The sex of an individual must always be determined by the nature of the gonad, regardless of the presence of abnormalities either of other parts of the genital system or of the secondary sexual manifestations of the body as a whole; consequently, this patient was of the female sex, in spite of so many secondary characteristics of the opposite sex.

EDWARD L. CORNELL.

**Kennedy, J. W.:** Is Plastic Surgery a Lost Art? *N. Y. M. J.*, 1916, ciii, 688.

It can be truthfully said at this date that plastic surgery is a lost art; that overwhelming interest in abdominal surgery and the greater skill required in plastic work has resulted in an almost total loss of interest in repair work. This is first evidenced by the fact that nearly every operator who has written anything on the subject comes out with a new operation which bears his name. At this date, without exaggeration, the number of operations for repair of the perineum rivals the number of varieties of a certain brand of condiments.

The seemingly great number of failures of immediate repair after parturition is due to the fact that men do not make the repair as an inside operation and do not include sufficient tissue in the bite of the suture. There is positively no reason why tears should not be repaired immediately and with perfect results. Primary repair work can and should be taught to every doctor in general practice.

As operators have trained themselves to work more and more with the curved needle, the sutures have become more and more superficial until in the swollen tissues of the parturient vaginal outlet, the bite of the suture is little more than the swollen mucous membrane which, of course, is useless as far as good results are concerned. This is coupled with the fact that many of the primary repairs are made from the outside and are merely skin procedures, while the tear occurred from the inside and should be repaired as such. There is no greater outrage to the principles of surgery than to advocate a lapse of ten days before the primary tear



is closed. Early repair of lacerations, even before the placenta is delivered, has some virtue from the standpoint of preventing infection.

In regard to suture material, the author condemns all absorbable ligatures. He uses shot instead of tying the sutures.

In secondary repair of the perineum, the principles of the Emmet and Hager operations will meet all conditions of lacerations of the perineum. In childbearing women, the Emmet operation is used; also in patients who are not of the parturient age and who have classical bilateral tears. On patients who have central tears and are near or past the menopause, the Hager operation is performed.

We are still looking for more substantial structures with which to correct cystocele. The difficulty has always been that there is so little stable structure between the vaginal vault and bladder to give substantial support. Many operations have been devised to hold the anterior vaginal wall at a higher level and thus correct cystocele. Many of these are ingenious, yet it is questionable if any particular operation has much advantage over a well done simple oval or triangular denudation.

It would be within the truth to say that at least 98 per cent of the office gynecological practice of the average physician or specialist is due to lacerations of the cervix. There is probably no source of revenue to the physician which is so dearly paid by the patient as that from the everlasting application of remedies to the lacerated cervix. A very large percentage of cases which give symptoms are due to neglected tears incident to labor. These cases are surgical in every particular. Indeed we might say that nearly all conditions of the eroded cervix are surgical.

The author has not treated a patient in his office with local applications for years. He has absolutely no office practice as far as local treatment of these conditions is concerned. Even in cases of erosion of the cervix in the virgin, if the patient is given a whiff of ether and the eroded surface gone over with a sharp curette, more can be accomplished in a minute than in a prolonged course of office treatments by local applications which annoy and embarrass the patient. The relation of cause and effect between laceration of the cervix and malignancy is so marked and pronounced at this particular anatomical site that we may say that laceration of the cervix is more than a predisposing cause of malignancy. Early and uniform repair of all lacerations cannot be too strongly urged.

Much of the repair work of the cervix at this date is a failure. The failures are due mainly to two things: the use of absorbable sutures and the too superficial inclusion of tissues in the bite of the suture. Cervical tissue heals very slowly and in many instances the absorbable sutures are gone before any attempt at repair has taken place.

The author has practically never amputated the cervix. He looks upon it as a "middle of the stream" or "on the fence" operation and has felt that either

vaginal hysterectomy or repair was indicated. Retroversion of the uterus often takes place after amputation of the cervix, a position quite impossible to remedy by pessary after amputation of the lower uterine segment; also a goodly number of strictures of the uterine canal follow amputation.

EDWARD L. CORNELL.

### MISCELLANEOUS

**Farani, A.: Precocious Menopause in Virgins** (Da menopausa precoce nas virgens). *Arch. bras. d. med.*, 1916, v, 287.

The author has observed two interesting cases of precocious menopause. The first case was a virgin, 33 years old, in whom there was definite cessation of the menses accompanied by phenomena of ovarian insufficiency and symptoms of melancholia. The second case also occurred in a virgin of 32 years, in whom ovarian insufficiency and a Basedow syndrome accompanied the cessation of the menses.

The author thinks that the absence of venereal orgasm might be the cause of this early menopause. He bases this opinion on these clinical considerations: First, he has observed two cases in which marriage improved a condition of ovarian insufficiency. In one of these cases the patient had an accentuated degree of genital hyperplasia with atresia of the vulvovaginal canal. After marriage there was a periodical blood flow through the genitals. The second consideration is that virginal dysmenorrhœa is cured by marriage. In such cases it cannot be said that the symptoms are due to a cervical stenosis because they disappear without dilation treatment.

The author thinks that in the virginal state, the sexual apparatus somewhat hypoplastic, may during coitus undergo intense pelvic hyperæmia during orgasm. This repeated several times may give rise to an accentuated circulatory condition in the genital zone which aids the functional activity of the ovaries and uterus.

On the contrary, if the stimulus is altogether lacking, there can only result after a certain time persistent and even augmented hypoplasia, which, with the ovarian insufficiency, inaugurates the precocious menopause.

W. A. BRENNAN.

**Block, E. B.: The Relation of the Mammary Glands to Nervousness and Menstruation.** *J. M. Ass. Ga.*, 1916, v, 155.

Block finds the administration of mammary substance of value in cases of excessive menstruation accompanied by a nervous anæmic condition.

The doses are: 2 tablets 3 times a day continuously, except during menstruation, when the dose is increased to 6 or 8 tablets 3 times a day, reducing it again to the former after the menses cease. The treatment is continued for a number of months.

The results obtained are: Shortened duration of menstrual period with lessened flow; decreased nervousness and pain; probably slowing of pulse; and enlargement of the breasts. L. R. GOLDSMITH.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Proust, R., and Buquet, A.: Accidents Due to the Rupture or Abortion of Simultaneous Tubal Pregnancies** (Des accidents liés à la rupture ou à l'avortement des grossesses tubaires simultanées). *Rev. de gynéc. et de chir. abd.*, Par., 1916, xxiii, 353.

Bilateral tubal pregnancy has been well known since the publication of Jayle and Nandrot appeared in 1904; but it is necessary to distinguish between successive and simultaneous pregnancies. Successive tubal pregnancies are the most frequent and give the impression of bilateral pregnancies. One of the pregnancies may be arrested in its evolution and terminate in a hæmatosalpinx, a hæmatocele, or a lithopedion without intervention being necessary. Intervention when made later in the evolution of the second pregnancy discloses the first, but in such event the bilateral lesion is quite distinct from that which is observed in the case of simultaneous pregnancies.

Again it happens in unilateral tubal pregnancy that a hæmatosalpinx develops on the opposite side. Frequently in the absence of a histologic examination it has been natural to consider and report such cases as bilateral tubal pregnancies.

The authors describe in detail, with macroscopic and microscopic findings, their personal case of simultaneous bilateral tubal pregnancy, in which there was a rupture of the right side with non-ruptured apoplectic pregnancy of the left side.

Practically the diagnosis of bilateral pregnancy is never made before intervention. On intervening for a tubal pregnancy, the annex on the opposite side should always be examined. If a hæmatosalpinx is found it must always be removed, because there is the possibility of there being a tubal gestation susceptible of ulterior rupture.

The diagnosis of simultaneous bilateral pregnancy must satisfy two conditions: (1) bilaterality; (2) simultaneity. Where the foetus is not apparent the question of bilaterality can be established by microscopic examination only by the presence of chorionic villi when they are found on the two sides. In the absence of a histologic examination the mere presence of a sanguinary intratubal collection on one side with rupture on the opposite side is therefore absolutely insufficient to make the diagnosis of bilateral tubal pregnancy. There is no question when a foetus can be demonstrated on both sides.

As regards simultaneity, there are two indications: (1) the macroscopical and microscopical appearance of the simultaneous lesions; (2) the concordance of the clinical results with the history of one tubal

evolution terminated in the typical cases by two almost contemporaneous ruptures or even a single rupture with bilateral pains.

Of the 75 cases of bilateral tubal gestation reported in the literature the authors think that about 41 may be considered as simultaneous gestations. For reasons stated, the authors moreover think that 8 of these cases are doubtful and they reduce the figure to 33 cases which are reported in detail with the bibliography.

The articles may be considered as a very clear exposition of the present status of this question.

W. A. BRENNAN.

**Da Silva, R.: Uncontrollable Vomiting of Pregnancy; Abortion with Improvement; Relapse and Death** (Vomitus gravidicos meoerceiveis; aborto obstetrico e melhora; recidiva e morte). *Arch. bras. de med.*, 1915, v, 447.

The author reports the case of a woman who at the end of her third month of pregnancy was seized with spells of vomiting which became so frequent and of such a nature as to be uncontrollable. Therapeutic measures indicated in such cases gave no results. The patient's pulse fell to 104 per minute, and her condition became so serious that the author determined to intervene in the pregnancy.

He emptied the uterus by digital curettage without incident. The following day the vomiting ceased and everything pointed to a favorable prognosis. Some days later, however, when some family trouble produced a very grave shock, she began to vomit afresh, first intermittently, then more frequently, and soon it again became uncontrollable as before intervention. Delirium ensued and the woman died in a comatose state thirty-one days after the intervention.

W. A. BRENNAN.

## LABOR AND ITS COMPLICATIONS

**Specht, A.: Parturition in Minors** (Ueber die Geburt bei Minderjaehrigen). *Zentralbl. f. Gynaek.*, 1916, No. 13.

Out of 10,350 births in the period from 1910 to 1913 which took place in the Kiel Klinik there were 81 in which the mother's age was under 16. Observations drawn from a consideration of these cases leads Specht to conclude that menstruation is precocious in such cases; that the development of the pelvis is premature; and that in such births the number of males usually is greater than that of females.

As compared with birth in normal adults,

Specht considers as favorable in these cases: the relative infrequency of troubles during pregnancy; the short duration of the labor; the fewer perineal injuries; fewer hæmorrhages; smaller infant morbidity and fewer stillbirths; and smaller maternal morbidity and mortality during the lying-in period.

The unfavorable concomitants are the more frequent occurrence of eclampsia, pelvic presentations, insufficiency of labor-pains, and premature birth. The frequency of the need of instrumental delivery and mortality of the child is the same as in normal adult labor. On the whole the author thinks that the general results of parturition in minors do not compare unfavorably with those of adults.

W. A. BRENNAN.

**Farani, A.: A Case of Dystocia by Fixation of the Shoulders After Birth of the Head** (Sobre um caso de dystocia no desprendimento das espaldas n'um parto caphalio). *Arch. bras. de med.*, 1915, v, 452.

Farani reports a case which came under his observation of dystocia of the shoulders after the disengagement of the head of an anencephalic child. The anomaly, which is not very frequent, consists in the mechanics of disengagement; i.e., posterior shoulder presentation deeply engaged while the anterior is retained above the pubis, buttressed by the subclavicular hollow and the acromion. This anomaly was due partly to the traction made on the neck of the fœtus by a midwife who had not recognized the cause of the dystocia.

The author after preliminary steps disengaged the shoulders by direct vulvar axis traction, then traction by the fingers, first disengaging the posterior arm, then the anterior shoulder by direct traction from below. There was a slight lateral perineal tear which was immediately sutured and the woman recovered normally. W. A. BRENNAN.

**Cogswell, J. W.: Rotation of the Posterior Occiput.** *J. Am. Inst. Homœop.*, 1916, viii, 1143.

This article may be summed up as follows:

Rotation of the occiput is preferable to the delivery with the occiput persistently posterior, whenever such rotation is reasonably possible.

Rotation of the occiput forward is usually best effected by the forceps, the Scanzoni-Fritsch maneuver being entirely feasible when the head is in the cavity of the pelvis.

The axis-traction forceps presents a ready means of delivery of occipitoposterior positions by allowing rotation to take place naturally and without opposition on the part of the operator.

The axis-traction forceps is, in many cases, preferable when the head is arrested in the cavity of the pelvis on account of the natural rotation which takes place, which is preferable to the artificial type as represented by the Scanzoni-Fritsch maneuver.

EDWARD L. CORNELL.

**Williams, J. T.: Delivery by the Natural Passages Following Cæsarean Section.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 425.

The author bases his conclusions on work which he and Mason reported in 1910, when from their experimental study and the reported cases of uterine rupture following cæsarean section they drew the following conclusions:

1. A carefully sutured and well-united scar will withstand any strain that can be endured by the uterine muscle.

2. Rupture of a cæsarean scar is always secondary to unusual weakness of the scar, dependent upon imperfect consolidation.

3. The most frequent cause of imperfect consolidation is the placing of deep stitches too far apart or not including the entire thickness of the uterine muscle.

4. Infection, in certain instances, plays a very important part in causing weakness of the cicatrix, etc.

After reporting briefly the histories of two patients who were delivered without accident subsequent to cæsarean section, the author in his present conclusions says that he realizes that definite deductions are impossible from a few cases but that he firmly believes further experience will only serve to confirm his opinion that where a uterus has been sutured with care and there has been no subsequent sepsis the cæsarean scar will be strong enough to withstand the distention of a full-term pregnancy or even the strain of labor itself.

C. H. DAVIS.

**Wolfe, R. D.: Vagitus Uterinus.** *Virg. M. Semi-Month.*, 1916, xx, 587.

The author reports a case of vagitus uterinus occurring in a woman delivered with forceps. The first blade was applied without trouble, but in applying the second blade the child began to cry, and cried three separate times. The cries were muffled as though the child were wrapped in a blanket, but they were distinctly heard in all parts of the room by the author and his consultant, and by two attending women. The baby was rapidly delivered and resuscitated with difficulty. For the production of crying *in utero* the membranes must be ruptured and there must be air in the uterus. Both these conditions are fulfilled during operative deliveries. In these cases nearly all the liquor amnii is drained away and air fills the spaces where the uterus is not in contact with the fœtus.

In a normal vertex presentation, on the other hand, the liquor amnii is not all drained away, so that there are no dead spaces for air to occupy. With air in the uterus one respiratory act is sufficient to produce a cry. Two factors may act as stimuli to respiration: (1) air coming in contact with the skin and (2) accumulation of carbon dioxide in the fœtus as the placenta is separated or compressed. The author believes the former to be the chief factor.



Of 45 reported cases more than half were operative deliveries. The foetal mortality was 10 per cent. After the cry is heard the only hope of saving the child lies in rapid delivery. These cases are important from a medicolegal point of view since the lungs may be partly inflated and the child die before birth. Finding air in a child's lungs would therefore not be conclusive evidence against an individual accused of infanticide.

C. D. HAUCH.

**Abernethy, E. A.: Painless Childbirth.** *Virg. M. Semi-Month.*, 1916, xx, 578.

The author finds that a combination of twilight sleep drugs and pituitary extract gives excellent results. The conclusions are based on a study of about one hundred cases.

The drugs should not be administered until labor is well established. As soon as the patient becomes distressingly uncomfortable an initial dose of morphine, gr. 1/6 to 1/4, and hyoscine hydrobromide, gr. 1/200, is given. When the pains lose their intensity and come farther apart 0.5 ccm. of pituitary extract is given. This is followed, if needed, by additional doses of hyoscine and pituitary extract. Never does the patient receive more than 1/50 hyoscine and 2 ccm. of pituitary extract.

In two cases labor was not as rapidly completed as desired and low forceps were successfully used without additional anaesthesia. One post-partum haemorrhage occurred on the eighth day in a frail patient suffering from chronic pelvic inflammation. The patient died on the twenty-eighth day from acute nephritis. There was one "blue baby," though it was not a delayed labor. The child recovered. Three patients suffered from delirium, but there had been complete loss of memory and the final results were good. In a few cases loss of memory was not complete because pituitary extract was given before the hyoscine had time to act. Ether was used as an adjunct in these cases. Exceptionally good results were obtained in cases with rigid os. The hyoscine is believed to relieve nearly all of these.

The chief advantages of the method are: the rapid dilatation of the birth canal, the absence of shock, the shorter labor, the absence of physical exhaustion, the absence of horror, and the diminution of pain.

The disadvantages are: some patients fail to respond readily to morphine and hyoscine, sometimes pituitary extract fails, and every possible complication is attributed to the drugs.

In employing the method it must be ascertained that there is no mechanical obstruction to delivery and it must be borne in mind that these are powerful drugs capable of producing serious harm if used without care.

C. D. HAUCH.

**Edgar, J. C., Foulkrod, C., and others: Painless Labor.** *Tr. Am. Gynec. Ass.*, Washington, 1916, May.

EDGAR spoke of the recent general agitation on the question of painless labor, saying it had accom-

plished much good (1) in stimulating research into newer and also into older methods of painless labor; (2) in demonstrating that the use of some preparation of opium, intelligently administered, was not as dangerous to the unborn child as had been supposed in the past; and (3) in emphasizing the baneful results of fear, pain, and shock of labor upon the present and subsequent mental and physical condition of the highly civilized neuropathic woman of the day.

Many, possibly the majority, of the upper highly civilized class of women are physically and mentally unfit to suffer an approach to spontaneous labor, by reason of their low resistance to the shock of labor; hence these women have pathological labors and are themselves neuropathic.

Never before has the need for an artificial painless labor been more urgent. Shock from the pain of labor in the highly civilized neurotic woman must be reckoned with in general childbed mortality. Painless labor for these women is a life-saving measure. Moreover, shock produced by the first stage of labor in these patients is a fact, not a theory.

For a time there was no ideal single method of painless labor. The only absolutely painless labor was one terminated by surgical means with complete anaesthesia. Conditions would always arise, for example in early rupture of the membranes, in which the necessity for painless labor would demand such surgical termination.

The ideal narcotic, analgesic anaesthetic for painless labor should possess the anoci-association of surgical practice, namely, first, the blocking of pain, fear, shock, and reflex sympathetic factors; second, the removal of reflex spasm and its resulting spastic or functional rigidity of the birth canal.

The most satisfactory painless labor method formerly used combined opium and antispasmodics for the first stage with possibly vapor narcosis toward the end of this stage; vapor analgesia and anaesthesia for the first and terminal parts of the second stage respectively. The narcosis aimed at until the perineal stage should be analgesic and not anaesthetic in character, whether by drugs or vapor, a difficult or impossible object to attain unless one had had considerable experience.

Ether and chloroform are too well known to need comment. Both in time lessen the force of the contractions and thereby delay labor. Unlike nitrous oxide vapor, they possess no oxytoxic action. They are the pain-controllers of the second stage, especially the perineal stage.

As an intermittent analgesic or anaesthetic, the nitrous oxide-oxygen mixture is well adapted to the second stage. Webster and his associates did much to make this method of painless labor popular. In the second stage, it does not interfere with uterine contractions as does ether and chloroform, but by arresting pain prevents shock and exhaustion, and the resistance not being lowered, the patient is better able to withstand subsequent infection or



complication. Edgar's experience has been limited entirely to its use in the second stage, and in all the mass of recent literature upon the subject, he gathers that it is of no value in the first stage, or the writers have avoided mention of its effect in this stage.

In the hands of inexperienced hospital internes, Edgar states that his results with this method have been deplorable, if not dangerous to the patient. Under the management or supervision of a first-class anaesthetist, the method has worked out beautifully. After experimenting with three gas machines, he finally settled upon a simple single bag instrument.

He disagrees with the opinion openly expressed that the administration is safe in unskilled hands. It is difficult to reconcile the statement of the recent advocates of nitrous oxide-oxygen analgesia and anaesthesia with the teachings of some of the most expert users of this gas combination. On the other hand we are repeatedly told that the use of nitrous oxide and oxygen for analgesia and anaesthesia is a simple matter for one to become proficient in after a few trials.

Edgar's conclusions are:

1. A satisfactory method consists in the use of nitrous oxide-oxygen analgesia or obstetric ether or chloroform for the second stage, pushed to anaesthesia for the perineal stage; possibly forceps delivery with vapor anaesthesia to eliminate part of the second stage.

2. Nitrous oxide-oxygen analgesia or anaesthesia is superior to any other during labor because of its oxytocic action.

3. Eventually an established method of painless labor might be rightly considered as a public health measure.

4. Lessening or abolishing the pain of labor might in the future limit birth control and criminal abortion.

5. Drug addiction after a prolonged drug narcosis in the neuropathic is a possible contingency.

6. The dangers to the unborn or newly-born child are negligible when drug narcosis is limited to the first stage.

FOULKROD gave an analysis of 32 cases, personally observed and attended by him. Of these 19 were primiparae, and 13 multiparae. The average duration of labor was fourteen hours. There were 22 L. O. A. presentations; 4 R. O. P. presentations; 3 R. O. A. presentations; 1 face presentation; 8 forceps deliveries, only 2 above the perineum. All the children and mothers are living.

While his conclusions are not yet matured, he would add one point of view to the large number of cases collected today, i.e., the fact that the number of cases formerly was so small as to emphasize the strong criticisms against such methods.

He contends that as there are only twenty-four hours in each day, and as an obstetrician must, at least, eat, if the development of these methods of analgesia is demanded by patients, they must perforce engage two physicians, that they may act in

relays as it were. Both must be competent to judge the effect of the anaesthetic used upon both mother and unborn baby. He states that he has not yet reached a stage where he could with equanimity go from a house and allow a patient or even a nurse to continue administering an anaesthetic over hours of time without some method of checking up results. He questions whether patients will be willing to compensate obstetricians for such service.

He contends it is unjust and perhaps dangerous to the best interest of the patient to have the attending physician give strenuous attendance for hours without rest and then find the grave necessity of some serious obstetrical operation facing him at a time when he is both mentally and physically exhausted. At times, one's best judgment is matured away from the bedside in such exacting work. He regrets that there is no known accurate method of checking up the effects upon the child *in utero* of any anaesthesia administered to the mother, and, in his opinion, to advance the idea that careful watching of the foetal heart sounds would show variations meaning danger to the child, evidences an entire ignorance of the principles of acoustics and of the normal variations of the heart-sounds occurring during the mechanism of labor.

A few questions briefly answered from Foulkrod's experience are as follows:

1. Does nitrous-oxide anaesthesia quiet the patient? Yes, decidedly so, when given during labor pains. He found that all patients complained less, were quieter between pains, and while some averred that it was not as highly anaesthetic as ether, which they had had before, they received the measure of analgesia that the operator wished.

2. Does it quiet the subjective sensation of pain? In 50 per cent of cases, decidedly so. In the balance, perhaps because of a tolerance, too much of the gas was required to get good analgesia. By this he meant that after finding the usual quantity needed for the average pain and the average woman he hesitated to go beyond that quantity for reasons given below.

3. Does it retard or lengthen labor by quieting sensation of pain? Yes, if the pains are very frequent. Even with such a fleeting anaesthetic as nitrous oxide he found that at the end of almost an hour the patient became saturated and did not wake up so readily. When the anaesthetic was not given for a time, several pains would elapse before the patients again complained severely.

4. Does it stop uterine contractions? All anaesthetics will stop uterine contractions if pushed far enough; nitrous oxide in a less degree than chloroform, morphia, or ether. Each patient reacts differently, and it requires trained watching to prevent deep anaesthesia even with the gas.

5. Does it relax the cervix? The author has never seen a cervix relaxed by nitrous oxide. It is, however, true that relieving the fear of pain always allows more strenuous efforts on the part of the patient, and more rapid progress is made on her part



in approaching an average physiological relaxation of the cervix by her own efforts.

6. Does it relax the perineum? Here, also, the answer is no; that any direct relaxing effects, such as would be attributed to chloroform in this stage of labor, must be denied. The author is still of the opinion that ether skillfully given, or perchance chloroform, is the ideal anæsthetic when the head is passing over the perineum.

7. Does it relax the patient muscularly? He has failed to secure sufficient relaxation to apply forceps or properly insert stitches; this not because of lack of anæsthetic effect, but because of a curious spastic jactitory stage, which had been his observation for years was present in continued nitrous-oxide anæsthesia.

8. Does it nauseate the patient? If given long enough it does. His number of nausea cases is he thinks perhaps not accurate, being only 15 per cent. But if continued long enough, there occurs an active nausea and vomiting, which may be an aggravation of a pre-existing nausea caused by the stretching of the cervix. In some instances, however, it is undoubtedly produced by putting the mask over the face and starting anæsthesia.

9. Does it asphyxiate the baby? In about 50 per cent of cases, when the anæsthetic had been used in both the first and second stages of labor, or for some time during labor, the babies were born blue but seemed to cry vociferously immediately upon being born, and appeared to be in no way harmed by the anæsthetic, the color clearing up in the usual time. In the rest of the cases the babies seemed normal. No babies have died after this method of anæsthesia in his practice.

10. Does it compare with ether and chloroform for the same purpose? Excepting for the relaxing effect upon the perineum or when a version is being done. The author does not think chloroform should be given during labor, because he believes that in ether we have a much safer anæsthetic which will accomplish the same purpose.

Foulkrod is confessedly a straight ether enthusiast. He has tried other anæsthetics, and he has been trying in an impartial spirit the present one, but up to the present writing he has failed to see where nitrous oxide could be used that ether could not be used by a skillful man with much better effect to both patient and operator. With the exception that nitrous oxide is a gas and ether must be vaporized, the former is therefore much more quickly available and will be so until a much quicker method of vaporizing ether is produced. His point then is this: Give ether in a vapor state, or if an anæsthetist who has learned how by apparatus or otherwise to secure the true vapor mixture with ether, necessary for anæsthesia, then ether enters into competition with nitrous oxide for this purpose.

Either one of two things is true: the nitrous oxide sold in cylinders on the market is a very dilute gas, or the claims of nitrous-oxide enthusiasts are

not proved. The only thing proved in the cases coming under Foulkrod's observation was that the patients came out of the anæsthetic quickly. In the majority of cases they did not go under as quickly, and it seemed to take an enormous amount of the gas to make any patient acknowledge that she did not feel any pain. This without much oxygen in the mixture.

He thinks it might be possible that the type and severity of the pains were different and so much greater than those for which nitrous oxide had been previously used, that he expected some magical effect in all cases. He states that in a few cases in the series he used nitrous oxide experimentally for a few pains, and then ether for a few pains, and then chloroform, in the same patient in one labor, the effect of the nitrous oxide proving as good subjectively as either of the other two.

He states that the question of whether part of the analgesic effect might not be produced by the deep breathing advised when using the gas has not in his mind been fully cleared up. Many operators had noted almost suggestive or hypnotic anæsthesia produced by such a method before they had ever thought of using nitrous oxide.

11. Does it produce bronchial irritation? None of the author's cases manifested any continued irritation, and the slight bronchial irritation which arose in a few cases he feels sure was due to the then prevailing epidemic infection.

12. Does it produce irritation of the kidneys? He found that the number of catheterized specimens sent after labor was inadequate to form any conclusions.

WAKEFIELD reported 100 consecutive cases. There were two stillbirths in the series. One of these was a high forceps delivery and probably should have been delivered by cæsarean section. The other was an anencephalic monster which could not have survived birth. Ninety-seven cases belonged to Class 1, i. e., patients who had no knowledge whatsoever of their labor from the time they went to sleep until they woke up and found their babies born. Three cases belonged to Class 2, i. e., patients who carried away from their sleep some unimportant recollections of occurrences but no recollection of pain. Of these 100 cases, 50 were primiparæ and 50 were multiparæ. The average duration of labor for primiparæ was thirteen hours and twenty minutes; for multiparæ nine hours and ten minutes. There was no case of post-partum hæmorrhage.

Childbearing among the women of today, with the type of nervous system which culture and education has developed, is unquestionably a formidable experience, productive, in its general results, of a great deal of physical wreckage, most of which is unavoidable. Because custom has made us look with tolerance and complacency on the suffering endured by women during labor is no reason why women should be allowed to continue to suffer when such suffering is avoidable, and that it can be avoided is an unquestionable fact. Moreover, the



intelligent women of America are daily becoming more cognizant of the fact that means exist to alleviate their distress and naturally are coming more and more to the point of expecting such means to be used. They consult their accoucheur and generally meet at his hands discouraging criticism of the different methods that have been successfully practiced. It is this opposition of the profession that is doing more than anything else to retard the progress of the use of anæsthetics in labor. Groundless criticism, however, can not long nor successfully endure against an aroused public opinion, particularly when that opinion is well founded. For the most part this criticism comes from men who have never personally used any of the prevailing recognized methods. Perhaps a general antagonism has been created by the undesirable publicity that has attended the use of the scopolamine method. To those who have used a good method and still condemn it, he can only say that somewhere there has been something faulty in its application, for he knows that at least one method is capable of consistently satisfactory application.

Anæsthetics in labor have come to stay. They mean too much to the economic life of women to pass into disuse. Dissatisfaction with the old régime has become more and more pronounced as time passes. It behooves those who practice obstetrics to consider well the attitude toward those means that have been successfully used by reliable members of the profession for the elimination of conscious pain in labor. It is much wiser to voluntarily advocate some good method now than to have such advocacy eventually forced on us by public demand.

For two years in Wakefield's private practice he has been using scopolamine as a continued anæsthetic, and in that time 175 patients have been thus treated. In his hands scopolamine has proved itself to be an absolutely ideal anæsthetic in labor, its results being highly satisfactory. He has yet to find a patient on whom it has failed to work satisfactorily, and he has yet to see a single contra-indication for its use. It disturbs none of the vital functions; on the other hand, it conserves them, and it does not make the labor pains less efficient. He believes that, sanely used, scopolamine is a perfectly safe anæsthetic, and that the best interests of both the mother and baby are subserved by its use. Its efficiency is entirely dependent on the reliability of the preparation used, and on the skill and good judgment shown in its administration. Perfection of results increases with experience.

Rather ideal conditions and surroundings are required for its success. For this reason it may fail to give satisfaction in the crowded wards of hospitals devoted largely to clinical work, especially where sufficient funds are not provided for the obstetric service. In private practice, however, most men who wish to take the trouble to do so can very easily create conditions that will make its use in every way practicable.

POLAK states that his experience includes the use of morphine-scopolamine in something over 500 cases, the use of gas and oxygen in over 100, etc. The last time he reviewed his cases, he found that in more than 550 cases there were only 4 foetal deaths. All these 4 foetal cases were autopsied. Three of the women went to full term, and the babies died within twenty-four hours after delivery. The autopsy showed in one a diaphragmatic hernia; in another atelectasis; in one there was hæmorrhage into both suprarenal capsules; and in the fourth he was unable to find any cause of death explainable at the autopsy except that the child was premature as a result of placenta prævia delivery. There was one maternal death in a case of placenta prævia where the morphine-scopolamine was used only in the early part of the first stage of labor and was discontinued after the second dose of scopolamine in a very long labor. A bag was introduced in that case, and he could not say that its use had any relation to the fatality.

Scopolamine-morphine has a definite place, just as gas-oxygen has a definite place in obstetrics, and each does certain definite work and neither can do the work of the other. He uses morphine-scopolamine in the first stage of labor, which relieves the terrible sacral pain which is not relieved by gas-oxygen, and gas-oxygen is used in the second stage which produces analgesia, and in a large percentage of cases the labor is absolutely painless. After the delivery of the baby he gives the woman an extra dose of scopolamine-morphine, so that surgical shock is absolutely guarded against.

It is known definitely that the use of scopolamine-morphine shortens the time of the first stage of primiparous labors and carries the women along to complete dilatation of the cervix. There is practically no danger from the use of scopolamine-morphine in the first stage of labor. There is, however, danger in the second stage of labor with prolongation of the second stage.

MANTON stated that he had tried nearly all the methods of producing anæsthesia which Edgar had spoken of with the exception of scopolamine-morphine which had never appealed to him, and he had finally settled on amnoform and chloroform. He injects amnoform hypodermatically, using one ampoule of 11 ccm. to complete the first stage of labor. He has used this drug in 75 cases and the results have been eminently satisfactory both to the patients and to him. In 25 per cent of the cases a second ampoule may be given after a couple of hours, and if that is not effectual the administration of chloroform will complete the successful treatment.

In the majority of his patients results were practically the same as those obtained by the advocates of so-called twilight sleep. In the majority of instances the patients were unconscious at the time of the birth of the child; they awoke in a vigorous condition, and there were no untoward sequelæ.

As far as the infants are concerned, he has so far lost no infants from the administration of this com-



bination, and in only two or three instances has the child been affected as much as when morphine was given alone. There is no asphyxia or amnesia of the child as a result of this combination.

DICKINSON stated that he was gratified to see the old chloral method revised which had been somewhat disused. As almost all gas-oxygen apparatus now contain ether attachments, instead of sticking to one method, if one switches on the ether in addition to the gas-oxygen, he has a method which is constantly being used now by those who are frequently employing gas-oxygen for major work. Dickinson believes that this is a method which should be used only by the expert; it is costly; it requires a resident anaesthetist; but he believes that the gas-oxygen ether combination is very advantageous and provides one more resource for the obstetrician. Gas-oxygen anaesthesia in his experience has enabled the obstetrician to sew up the lacerated perineum at once without relaxation of the uterus, such as is produced by chloroform, and particularly by ether.

**Duncan, J. W., Holbrooke, C., and Phelan, G. W.:** *Twilight Sleep.* *Canad. M. Ass. J.*, 1916, vi, 97.

It is well to remember that it is not the endeavor in twilight sleep to produce anaesthesia, but analgesic amnesia, and that experience alone teaches what true amnesia is.

The following suggestions are given as to its use:

1. Cases must be selected; the treatment is not universal. The patient must measure up to a standard which is high. She must be a normal, healthy woman, with the elements of labor well established and pointing to a normal conclusion.
2. The foetus must give every evidence of good vitality.
3. The administrator must possess obstetrical diagnostic ability and an appreciation of the foetal heart sounds.
4. Every patient is an individual entity and must be treated as such, no two cases requiring the same repetition or dosage.
5. Each case demands the full individual attention of the administrator.
6. Labor does not seem to be prolonged, rather shortened.
7. The patients show less exhaustion, and even when full amnesia is not obtained are all much quieter, seemingly suffering less pain.
8. Lactation is not hindered.
9. The blame of failure, in most cases, can be ascribed to the administrator. Foetal deaths are often ascribed to the treatment, when other causes in the course of a labor without the drugs frequently bring them about.
10. While the treatment can be carried out with more ease and efficiency in the hospital, just as good success can be obtained in the private home if the administrator is willing to devote the necessary attention to his case.

11. The use of the method is in its infancy and is worthy of development.

While continuing their investigations of twilight sleep, the authors are examining the value of nitrous oxide and oxygen, after the method laid down by Webster, as an analgesic during parturition.

EDWARD L. CORNELL.

**Hingston, C. A. F.:** *The Uses of Pituitary Extract in Labor at the Government Maternity Hospital, Madras.* *Indian M. Gaz.*, 1916, li, 81.

Hingston reports the results of 1,000 doses of pituitary extract given to women in different stages of labor. He divides the cases into the following groups: (1) treatment with pituitary extract alone; (2) treatment with pituitary extract and small doses of morphia; (3) treatment with pituitary extract and large doses of morphia; (4) treatment with pituitary extract, morphia and scopolamine (twilight sleep); (5) treatment with pituitary extract and chloroform; (6) cases of caesarean section in which pituitary extract was given 5 minutes before; (7) cases of induced labor in which pituitary extract was given to induce labor.

The earliest time of administration in Groups 1, 2, 3, 4, and 5 was when effacement of the cervix occurred. Dilatation of the os was not necessary.

The severe pains following the injection of pituitrin were relieved best by chloroform or morphia (gr.  $\frac{1}{4}$ ). Large doses of morphia (gr. 1) produced "blue babies," as also did twilight sleep; two babies died with the latter procedure, although the heart beat strongly for an hour. The best results were obtained with chloroform.

Indications were: (1) weak pains; (2) to hasten delivery with normal pains; (3) for a floating head — when there was no disproportion — as a substitute for high forceps; (4) as a prophylactic against post-partum haemorrhage; (5) to prevent bleeding in caesarean section.

The place of administration was the arm, as better action was secured from the arm than from any other part.

To induce labor, pituitary extract was given and at the same time the membranes were separated with the finger for three-fourths of an inch about the os.

W. F. HEWITT.

## PUERPERIUM AND ITS COMPLICATIONS

**Plass, E. D.:** *Post-partum Care of the Perineum.* *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 107.

In order to demonstrate whether the usual routine antiseptic treatment of the perineum after delivery has any distinctly beneficial effect upon the course of the puerperium or upon the healing of the primary perineal repairs, the author carried out the following clinical experiment.

For a period of nine months he divided all patients into two groups after delivery, A and B (every alternate patient being placed in Group A), and treated them as follows. Those in Group A

were given the routine perineal care and those in Group B were given no special attention. The routine care consisted in bathing the vulva and perineum with cotton pledgets soaked in 1:2,000 bichloride of mercury solution every four hours, as well as after each defecation and urination during the nine days the patient remained in bed. The patients in Group B were merely kept macroscopically clean with warm tap-water and soap and a wash cloth. No attention was paid to voiding or bowel movements, unless, as sometimes happened after the initial dose of cathartic, the need of cleansing the parts was apparent. The bloody lochia were removed whenever necessary. Unless the patient was very ill, she was expected to keep herself clean. He found that the average number of cleansings necessary was as follows: four a day for the first three days, between the third and sixth days not more than two a day, and after that only one, at the time the morning bath was taken.

At the end of the experiment, when each group contained 200 cases, the records were carefully tabulated and examined, and the author's conclusions were that the use of antiseptic solutions in the care of the perineum during the puerperium or in the after-care of primary perineorrhaphies is of no value. Macroscopic cleanliness alone gives better results and effects a considerable saving of time.

GEORGE E. BEILBY.

#### MISCELLANEOUS

**Falco, A.: Histologic and Physiopathologic Research on the Internal Secretion of the Pancreas in Pregnancy** (*Richerche istologiche e fisiopatologiche sulla secrezione interna del pancreas in gravidanza*). *Ann. di ostet. e ginec.*, 1916, xxxviii, 1.

In recent years many animal experiments have been undertaken to determine the effects of pancreatic secretions during pregnancy and the puerperium. Some have considered that during pregnancy the islands of Langerhans are in a condition of hypofunctioning both on account of their demonstrated reduction in number as well as cellular retrogression. Others have thought, however, that the condition is manifestly one of hyperfunctioning.

Falco has undertaken a series of experiments on rabbits and guinea pigs to determine which opinion is correct, and he compares and discusses his results with the experiences obtained by many other observers. The conclusions which his experiments finally enable him to reach are:

1. The islands of Langerhans in pregnancy show on histologic examination a diminution of their activity.
2. Total pancreatectomy in gravid guinea pigs does not provoke glycosuria; instead it causes all the other symptoms of pancreatic diabetes.
3. The deficient symptom of glycosuria does not appear to be caused by the action of the internal secretion of the foetal pancreas, but rather it is the effect either of the utilization of the sugar by the

foetus or of the presence of a placental ferment in the maternal blood.

4. Experiments with placental injections and ingestions seem to demonstrate that the placenta plays by no means a light part in hydrocarbon metabolism.

W. A. BRENNAN.

**Edgar, J. C.: Supervision of the Midwife.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 386.

The author who has given this subject long and very careful study concludes as follows:

1. The midwife has no place in modern medicine or surgery.
2. For the present the elimination of the midwife is an impossibility.
3. The midwife is today a necessary evil, for traditional, social, and economic reasons, attending as she does about 40 per cent of confinements in this country.
4. Of the three professions, namely, the physician, the trained nurse, and the midwife, there should be no attempt to perpetuate the last named as a separate profession.
5. The midwife should never be regarded as a practitioner, since her only legitimate functions are those of a nurse plus the attendance on normal deliveries when necessary.
6. The solution of the midwife question in the rural and outlying districts is to be found in the inclusion of midwifery service in rural district nursing, should a physician not be available.
7. Control of the education, licensing, and annual renewal of license should be in the hands of the State Board of Health or State Board of Education, supervision of the midwife by the local board of health, and annual renewal of license to depend on the midwife's record during the year.
8. State license, state control, high standard of education, annual renewal of license, critical and constant supervision of the midwife, encouragement to trained nurses to take out midwife licenses, and further extension of dispensary maternity services will mitigate the midwife evil, reduce the ranks of the midwife, and render the remaining ones less of a menace to the country, and pave the road for their final elimination.

The author quotes some very interesting statistics from the midwife conditions in New York.

C. H. DAVIS.

**Baldy, J. M.: Is the Midwife a Necessity?** *Am. J. Obst.*, N. Y., 1916, lxxiii, 399.

The author believes that theoretically the midwife is unnecessary, just as osteopathy, chiropractic, Christian Science, and other cults of the same kind are unnecessary, but these things do exist and the community demands them.

Since the time has not come when it is possible to eliminate the midwife, the proper thing to do is to educate those already in the field and to strictly regulate those in practice. This will lessen their



number in a way which even prohibition would not do.

The education of new midwives, or the admission of fresh ones coming from other countries is of dubious value.

Hospitals with maternity departments and maternity hospitals should be developed to the point of highest efficiency, and this class of patient should be encouraged to go to them for help.

A lessening of the number of midwives by the elimination of the unfit, together with the refusal of admission to any or possibly but a few new ones, and the placing of ample service of maternity hospitals and maternity wards at the disposal of the community will go a long way toward eventually doing that which prohibition cannot do in the elimination of the midwife.

C. H. DAVIS.

**Weller, C. V.: Two Additional Cases of Miliary Tuberculosis of the Placenta with Clinically Latent Tuberculosis of the Mother.** *Arch. Int. Med.*, 1916, xvii, 509.

The two cases of placental tuberculosis presented were discovered in the routine microscopical examination of the placentas. The mothers did not have clinically recognizable lesions at the time of delivery, but in one case an active pulmonary tuberculosis developed later, and in this one there was also a history of tuberculosis six years before her last pregnancy. The first case became latent after the birth of the child. These cases are additional proof of the fact that even an incipient and unrecognizable tuberculosis may be so influenced by pregnancy as to cause a placental, and therefore potentially a foetal, miliary tuberculosis.

C. D. HAUCH.

**Cameron, M. H. V.: Cystic Hygroma in an Infant.** *Canad. M. Ass. J.*, 1916, vi, 137.

The infant presented at birth a tense fluctuating mass on the left side of the neck. This mass obliterated the line of the jaw and chin, was spheroidal in outline and displaced the larynx toward the right. It half filled the mouth, completely filled the pharynx, and effectively prevented breathing. A finger passed into the pharynx displaced the tumor from its pressure upon the larynx and the child breathed. When the finger was removed, breathing ceased and the child became cyanosed.

Respiration was kept up by holding the tumor away from the larynx until the operation began. Cyanosis deepened and when the incision was made along the lowermost crease of the neck on the left side, the child did not flinch nor did the wound bleed. The left sternomastoid muscle was retracted and a plane of separation found beneath the deep fascia of the neck. The tumor was quickly separated as far as the middle line of the pharynx behind, when it was opened and its watery content evacuated. The wall of the cyst was then clipped

at a safe distance from the carotid sheath to which it was attached, the cavity packed, and the skin closed to within a quarter inch of the lower end of the incision. Black blood began to flow as the last of the cyst wall was clipped away and the child cried as the last of the sutures were being inserted.

The day following the operation there was blood-stained vomit. The next day blood was found in the stool and on the third day there were petechial hæmorrhages on the body and in the mouth. On the fifth day the child had lost three and one-half pounds and was apparently moribund. A request was made for permission to do direct transfusion of blood, but this was refused. One 10-ccm. dose of normal horse serum was given, and on the sixth day the child was nursing. The wound healed by first intention and in three weeks there was no evidence of sinus formation and the scar was to be noted merely by a contraction in the platysma near the lower extremity of the wound.

EDWARD L. CORNELL.

**DeLee, J. B.: Progress Toward Ideal Obstetrics.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 407.

The author is fundamentally opposed to any movement designed to perpetuate the midwife for the following reasons:

1. The midwife is a relic of barbarism. In civilized countries the midwife is wrong, has always been wrong. The greatest bar to human progress has been compromise, and the midwife demands a compromise between right and wrong. All admit that the midwife is not what she should be; it has been proven time and time again that it is impossible to make her so — further, a part cannot be equal to the whole, and yet there are those who, crying expediency, are willing to foster and perpetuate this evil.

2. The midwife today is not an absolute necessity. The secretary of the Illinois State Board of Health states that about 1,200 midwives are registered, 900 of whom are in Chicago. Of the 101 counties in the state, statistics were received from 87, and it was found that no births were registered by midwives in 37 counties in Illinois. In our large cities various agencies as maternity clinics are each year caring for an increasingly large number of poor women and gradually displacing the midwives.

3. It is impossible to train the midwife sufficiently to make her a safe person to attend labor cases. Obstetrics is a major science. It requires the highest kind of skill, in addition to much knowledge, to do even tolerable work.

Europe has tried to educate midwives for many centuries, and has failed signally. Ekstein, of Teplitz, calls the midwife situation in Austria and Germany a state of misery. If the medical profession fails to establish tolerable conditions in Germany, can we hope to succeed here? C. H. DAVIS.

## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**Staehlin, E.: Congenital Cystic Kidneys—Etiology and Clinical Inference.** *Am. J. Surg.*, 1916, xxx, 110.

Staehlin quotes extensively from authoritative sources as regards the polycystic kidney and emphasizes the recognized fact that these kidneys remain functionally active, even the thinnest cystic septa carrying normal glomeruli and tubules. This explains why a kidney hopelessly cystic and degenerated in appearance with apparently no normal renal parenchyma will still throw off approximately a normal urine. They maintain their function remarkably, the collapse being rather an immediate one.

He reviews the embryological studies from Kupfer in 1865, down to the present, on which he bases his conclusions: Not all polycystic kidneys are congenitally cystic; some, perhaps a considerable proportion, of isolated cysts are retention cysts, the renal tubules dilating as a result of obstruction—acute cystic dilatation of tubules as the result of acute parenchymatous nephritis, resulting from the blocking of the narrower descending loop of Henle by the shredded cells of the first convoluted tubules.

It is rational to believe that interstitial fibrosis by contraction and obliteration of the lumen of the tubules may lead to similar obstruction cyst formation. It is striking how frequently these scattered cysts are associated with chronic diffuse nephritis. But it is plausible to consider that from an etiological standpoint all congenitally polycystic kidneys are bilateral and due to lack of fusion between the secretory and collecting tubules, whereas an acquired cystoma is the result of a blocking in that portion following inflammatory changes and may be bilateral, though not necessarily so; it is not congenital and not due to lack of fusion. These are acquired polycystic formations in the kidney, unilateral or bilateral as the case may be, in contradistinction to the congenital variety, which are always bilateral.

He cites his case, stating with rather refreshing candor that the first kidney involved was removed, "owing to a lack of appreciation of the pathological condition." At a later date the remaining kidney became involved, but when last reported was still functionally capable.

The diagnosis and management are discussed, particular caution being urged against using ether anaesthesia, since uræmia may follow its use.

F. R. CHARLTON.

**Macedo, C. M.: The Periods of Betterment in Renal Tuberculosis** (Los periodos de mejoría en la tuberculosis renal). *Cron. méd.*, 1916, xxxiii, 33.

The author gives detailed clinical histories of three cases of renal tuberculosis. His observations lead to the conclusion that in the periods of alleviation and apparent cure of renal tuberculosis some of the major symptoms may disappear while others persist and reveal the primitive pathologic condition of the kidney to the physician.

The symptoms which diminish in intensity or disappear are: (1) the lumbar pain; (2) the frequency of micturition, which diminishes progressively and becomes normal; (3) hæmaturia, which is generally not observed in alleviation periods.

The symptoms which persist are: (1) polyuria, which remains practically constant; (2) albuminuria, reduced to vestiges, but still always present; (3) pyruia, in small proportion but constant; (4) tuberculous bacilluria.

The general state of the patient shows marked improvement. In all cases there is an increase of weight and other noteworthy signs. Cystoscopic study shows that acute cystitis of tuberculous origin may evolve into a chronic condition compatible with normal functioning of the bladder and that cicatrices of advanced tuberculous lesions may be seen.

Tests of the functional capacity of the kidneys (phenolsulphonephthalein and Ambard's urea constant) do not show that the renal function has improved in the periods of improvement. Hence, the general conclusion is that the cure of advanced renal tuberculosis is only apparent and that the evident relief which the patient experiences is not compatible with a long life. The author concludes that an early nephrectomy offers the only chance to the patient.

W. A. BRENNAN.

**Stokes, J. H.: Acute Syphilitic Nephritis, from the Standpoint of Diagnosis and Salvarsan Treatment.** *J. Am. M. Ass.*, 1916, lvi, 1191.

The author finds that syphilitic nephritis is uncommon and few cases have been reported in American literature. He believes, however, that with the new diagnostic criteria it is probable that more cases will be recognized and treated as such. A case is reported which illustrates the efficiency of mercury and rest and the inefficiency of either form of treatment without the other. Stokes demonstrates that salvarsan can be used in small doses in severe luetic nephritis.

The author comments on the findings in his case.



He refers first to the onset, and cites the opinions of numerous observers. Abrupt onset, moderate but transient oedema, marked loss of weight and weakness when the condition was at its height, and a surprising lack of more serious impairment of the general health, were the main clinical features in the case he reports.

The urinary findings showed that the urine contained great quantities of albumin. The sediment contained a few red cells; the white cells were in excess of the red. There may be much epithelium, and many lipid or fatty casts. Two important urinary findings are the presence of double-refractive lipoids (which are probably not an absolute finding since these bodies were present in the urine of many non-syphilitics) and the isolation of the spirochæta pallida in the urinary sediment. The status of the latter finding is at present unsettled.

The diagnosis centers about: (1) the recognition of syphilis in the patient; (2) the identification of nephritis as due to syphilis and not simply a parenchymatous nephritis occurring in the course of syphilis; and (3) differentiation of the nephritis from one due to treatment. In regard to the first point the author considers the Wassermann examination of great value. He believes that the history is untrustworthy since the nephritis may follow an unnoticed or concealed primary lesion, and may precede all eruptive phenomena, which may have been mild even when present. Oedema may mask the clinical signs of syphilis on the skin. In commenting on the second point of diagnosis Stokes states that the negative evidence of a lack of other adequate reasons for the nephritis should arouse suspicion. Examination of the sediment for double-refracting lipoids and for the spirochæta pallida should be carried out. The therapeutic test is of the greatest importance as was demonstrated in this case. As regards the third point, the author finds that the differentiation of a mercurial from a syphilitic nephritis is difficult. He calls attention to the characteristic findings of mercurial nephritis and the improvement of the condition when the mercurial treatment is suspended, as points of differentiation.

As to treatment the author cites the opinion of many writers, some of whom insist on the milk regimen, while others believe it unnecessary. Still other authors believe that mercury gives the best results and others use the mixed treatment. The author's experience in the case reported shows the value of mercury and illustrates the slowness of its action compared with that of salvarsan, and its inability to prevent the onset of complications. He found that the dosage of less than 1 grain of salicylate was insufficient to keep the situation under control, and yet a moderate increase (that is, 1.5 grains) gives rise to an accumulation, causing irritation. He found, therefore, that the margin of safety was distinctly narrow.

A critical estimation of the value of salvarsan in the treatment of acute nephritis of syphilis is ham-

pered by the scarcity of the reports of its use in these unusual cases. The author reviews the work of many observers of large experience and finds that a number of them have experienced no difficulty in using salvarsan in this type of cases providing the initial dose is small. He concedes the necessity for combined treatment as a general measure and his experience in the case reported favors salvarsan or arsenobenzol as compared with mercury to control the condition.

The author concludes as follows:

1. Syphilis as a causative factor in acute nephritis is easily overlooked or its significance not appreciated.

2. The complication may develop in the course of efficient mercurial treatment (intramuscular injections).

3. The best recognized points in diagnosis are: (1) establishment of the existence of early syphilis; (2) high albumin content; (3) double refractive lipoids in the urine; (4) therapeutic tests. Of these, 3 and 4 are probably the most reliable and 1, 2, and 4 the most available.

4. Spirochæta pallida should be searched for in the sediment of a catheterized specimen on the recommendation of Hoffmann.

5. The diagnosis in the present case was established by points 1, 2, and 4, and later 3. Of these, the therapeutic test rendered the best service, because of its availability.

6. The administration of salvarsan is a valuable aid in the diagnosis and treatment of acute syphilitic nephritis.

7. The risk in administering salvarsan in proper doses to a nephritic suspected of being syphilitic, to establish a diagnosis, is no greater and perhaps less than that incurred by using a sufficient dosage of mercury.

8. The effect of salvarsan is much more prompt, but in small doses less lasting, than that of mercury in average doses.

9. The general therapeutic response is probably better with salvarsan than with mercury.

10. Renal injury from salvarsan seems to be the result of overdosage, either in the form of too large or too frequent injections.

11. The place for mercury would seem to be, after the disappearance of the albumin, to secure permanent results.

12. Small doses of salvarsan, from 0.15 to 0.2 gm. or its equivalent, at weekly intervals, are adequate, and must not be exceeded at the outset, but may be cautiously increased to 0.4 gm. later.

G. J. THOMAS.

**Fowler, H. A.: Renorenal Reflex Pain; Report of a Case.** *Surg., Gynec. & Obst.*, 1916, xxii, 454.

Fowler calls attention to the frequency of occurrence of atypical symptoms in cases of stone in the kidney or ureter which are confusing and misleading. Errors in diagnosis have frequently occurred when the subjective symptoms alone were



considered, and useless and unnecessary operations have been performed.

That the symptoms due to stone in the kidney or ureter on one side may be referred to the opposite side, when the latter kidney or ureter is shown to be healthy — renorenal reflex pain — was first pointed out by Knowsley Thornton. The occurrence of this reflex pain has been accepted by numerous observers and denied by others. The author reviews the literature of the subject, analyzes the evidence submitted and concludes that, while the phenomenon is rare, its occurrence is amply supported by the evidence, particularly the more recently reported cases which have been studied in greater detail and are not open to criticism.

Fowler's own case may be briefly summarized as follows:

A young woman, aged 29, suffered with typical right-sided attacks of renal colic. She had had two previous attacks similar in character, the first one ten years before. There was tenderness over the right kidney, and slight muscle rigidity. X-ray examination showed a stone shadow in the left ureter, otherwise the plates were negative. Wax-tipped catheters were used in both ureters. Obstruction was met in the left ureter 24 cm. from the ureteral orifice. This was finally passed and a very distinct scratch in the wax obtained.

Specimens obtained from each kidney showed normal urine from the right kidney, while the urine from the left kidney contained some pus, red cells, and considerable albumin. The urea output of the right kidney was exactly eight times that of the left.

The stone was removed and all symptoms and signs of trouble disappeared. The patient has remained entirely well up to the present time, more than a year after the operation.

**Newman, D.: Pain in Renal and Vesical Lesions; Its Characteristics, Its Anomalies, and Its Misguiding Manifestations.** *Lancet*, Lond., 1916, CXC, 724, 773.

Newman observes that some bladder diseases are free from pain, viz., papilloma, bacillus coli cystitis, and tuberculosis of the anterior wall, while on the other hand pain out of proportion to the extent of the lesion may be present when the neck of the bladder or the first part of the urethra is involved. When the mucous membrane is intact the pain is not generally very great, but if it becomes ulcerated the pain is greatly increased when the bladder is evacuated and lingers after urination. In diseases of the kidney, dull persistent pain in most cases indicates a slow steady change in the condition and bulk of the renal parenchyma or in the size of the pelvis as in tuberculous nephritis and in tumors. Generally, in diseases where the increase in the bulk of the organ is slow, or the distention of the pelvis is very gradual, the lesion does not cause much pain; for example, in chronic hydronephrosis, polycystic kidney, and tuberculous nephritis without pyelitis. Persistent pain

of renal origin is most likely to result from inflammation of the pelvis and ureter, the presence of an impacted stone, rapidly advancing malignant disease, or tuberculosis with ulceration of the pelvis. Torsion of the renal vessels and of the ureter may lead to one or more of the following symptoms: (1) albuminuria with or without casts; (2) hæmaturia; (3) dull ache and pain in the kidney region associated with attacks of kidney colic.

Displacement of the kidney may impede the urinary flow in various ways: (1) by kinking from rotation of the kidney on a short axis; (2) by obstruction from bending of the ureter in some part of its course; (3) by occlusion of the lumen through angular insertion of the ureter into the bladder.

B. S. BARRINGER.

**Gewin, W. C.: A Review of the Present Status of Surgery in Certain Kidney Conditions.** *Am. J. Surg.*, 1916, XXX, 114.

Gewin offers a valuable compilation from many sources. He quotes extensively from Pousson, who seems to be returning to the Edebohls idea in treating nephritis. Pousson believes that decapsulation and nephrotomy may cause the elements still intact to proliferate and replace destroyed areas. This was the Edebohls idea in all essentials. He states that in twenty-four cases of chronic nephritis operated upon, he delayed the fatal outcome from two to fifteen months.

Kuemmell likewise is quoted along the same lines. He, like Pousson, prefers decapsulation first and nephrotomy as an adjuvant measure. Further extended quotations are given to support the claim made for scientific advances along the lines of renal surgery.

F. R. CHARLTON.

**Quinby, W. C.: The Function of the Kidney when Deprived of Its Nerves.** *J. Exp. Med.*, 1916, xxiii, 535.

In the present investigation Quinby attempted to examine in detail the function of a kidney which had been removed from the body and subsequently replaced. By this method he made certain that the organ was entirely outside the sphere of all nervous influences, for a time at least if not permanently, and the response of such a kidney to the various functional tests gave the author at least indirect evidence on the question of secretory innervation.

His experiments were carried out on large dogs of both sexes. The kidneys were removed and then reunited to their own severed vessels, for in this way the author believed the nearest approach to the normal physiological condition was secured. From his experiments he makes the following summary:

1. By means of vascular suture it is possible to remove the dog's kidney from the body and later to restore it to its former position.
2. Such a kidney is removed from the control of the nervous system, at least for a time.
3. Examination of the function of a kidney so



treated shows an initial period of overaction as compared with that of the normal kidney. This period is followed by balanced action.

4. The more recent tests of renal function show that a single reimplanted kidney is able to maintain normal life indefinitely.

The results of these experiments, together with the evidence already at hand, suggest strongly that secretory nerves to the kidney do not exist.

GEORGE E. BEILBY.

**Peacock, A. H.: Multiple Ureters with Hydro-nephrosis.** *J. Am. M. Ass.*, 1916, lxxvi, 1088.

Peacock reports the case of a boy of nine months who up to his sixth month was entirely normal; after that time there was loss of weight, distention of the abdomen, milky and offensive urine. The patient died at the end of his ninth month. Autopsy gave the following findings:

Stricture of the urethra 1 cm. anterior to the prostate, admitting a No. 6 catheter; bladder distended. There were three ureteral openings in the bladder: two coming from two ureters running to two separate pelves in the right kidney, the third ureter running to the left kidney. One of these ureters, the one from the right kidney, emptied into the prostatic urethra. There was a fourth rudimentary ureter running from the upper pole of the left kidney and ending blindly in the bladder. All of the three patent ureters were enormously distended. The right kidney was a pyonephrotic sac.

B. S. BARRINGER.

#### BLADDER, URETHRA, AND PENIS

**Posados, I. N., and Pozzi, E.: Oedema Bulbosum of the Bladder** (*Edema bulbosum de la vejiga*). *Semaine méd.*, 1916, xxiii, 171.

Oedema bulbosum of the bladder does not form a morbid entity but is a symptom which occurs in various vesical affections. Among the most frequent causes of oedema bulbosum are: (1) vesical traumatism resulting from cystoscopic treatments, etc.; (2) inflammatory processes of the bladder and prostate; (3) ureteropyelitis and ureteral calculi; (4) inflammatory perivesical lesions; (5) genital lesions in the female — uterine cancer, uterine fibroma, etc.

The author reports a case in a woman of 41. From the sixth month of her last two pregnancies she experienced frequency of micturition and hæmaturias lasting eight days with extremely bloody urine. Her last parturition, three years previous, was difficult and was followed by hæmaturia, urinary retention, with alternations of frequency of micturitions, etc. The phenomena would diminish for a period of six months or so, only to be renewed with greater intensity. During all this period the woman had been treated with vesical lavages of nitrate of silver, boric acid, etc.

The authors after cystoscopic examination diagnosed oedema bulbosum of the bladder and instituted

treatment of lavage with warm water (45°), under which the symptoms gradually diminished and disappeared.

The authors consider this case as resulting from a chronic cystitis which was maintained by the energetically irritating treatment to which she was subjected and which injured the bladder. Of two guinea pigs inoculated with sediment from the urine of this case one developed an abscess at the site of the injection and the second died on the fourth day of septic peritonitis.

W. A. BRENNAN.

**Taddei, D.: Vesical Fistula Due to a Permanent Foreign Body in the Bladder** (*Fistola vescico-otturatorio-cutanea conseguente a permanenza di un corpo estraneo nella viscica*). *Riforma med.*, 1916, xxxii, 38.

In the case described by Taddei which was in a woman of 21 the symptoms began with pains in the internal and posterior part of the left thigh which were interpreted as sciatic.

After some months a very painful tumefaction appeared in the posterior part of the genitocrural sulcus. This finally ulcerated and discharged a large quantity of pus.

Owing to the persistence of the cutaneous aperture and the constant discharge of thin, torbid, irritating fluid, the patient ultimately went to the hospital. Radiography showed a foreign body in the bladder, and the genitocrural aperture was diagnosed as a vesicular or perivesicular fistula, which was confirmed on operation.

After a median suprapubic incision was made the bladder was ultimately reached and incised, and the foreign body extracted. At the upper extremity there was a large ulceration and at the lower extremity at some distance from the ureteral orifice there was an opening corresponding with the fistulous aperture.

There were several noteworthy points in this case, the most important being the route selected by the perivesicular suppuration to reach the skin.

Generally in perivesicular suppurations the pus finds an exit per vaginam, or by the rectum, or into the perineum.

The usual procedure of freeing the bladder from the surrounding tissues, freshening the edges of the perforation, and suturing could not be carried out in the case owing to the tenacity of the pericystic adhesions as well as to the depth of the ulceration. Moreover, the result of suture was doubtful owing to the septic condition of the vesical cavity. The author therefore confined himself to curettage of the region of the ulceration and excision of the obturator-cutaneous part of the fistula. This gave good results.

W. A. BRENNAN.

**Walker, J. W. T.: Hexamine as a Urinary Antiseptic.** *Med. Press & Circ.*, 1916, ci, 304.

Walker defines a urinary antiseptic and says: "It is a drug administered by the mouth with the object of producing an antiseptic action in the

urine." He notes that such a drug action is under two very great disadvantages because it must pass through two selective organs, the intestine and the kidneys, as well as circulate in a powerful oxidizing agent, the blood.

The author discusses a great many experiments which he has made with hexamine (hexamethylene-tetramine). He advises the use of plenty of water when this drug is employed, to prevent its splitting up in the stomach. He has had tabloids made coated with keratin, in which form it does not split in the stomach and does not cause stomach symptoms. For the recognition of formaldehyde in the urine, the author recommends the test which he calls the Burnham-Rimini test, which is described as follows:

In Burnham's modification of Rimini's test, the following three solutions are used: (1) phenyl-hydrozine, hydrochloride, 0.5 per cent; (2) sodium nitroprusside, 5 per cent; (3) a sodium hydrate saturated solution. Three drops of each of the first two solutions are added to the urine, and a few drops of the sodium hydrate solution poured along the side of the test tube. The urine and the sodium hydrate should be warmed to slightly above the body temperature. If formaldehyde is present, a dark greenish-black cloud passes down through the urine. This rapidly changes to green, and fades through bright green to orange and pale yellow.

Walker advises the use of 15 to 20 grains of urotropine per dose, three times per day. He then takes up the general proposition of conditions which modify the action of hexamine.

As regards the variations in the reaction of the urine the following notations are made:

1. The author shows the necessity of maintaining the urine in an acid state. He says that practically only two drugs will do this; namely, acid sodium phosphate and ammonium benzoate.

2. As to the influence of alkalies and acids on the action of hexamine, where the alkaline is due to bacterial decomposition so long as the urine remains alkaline, no formaldehyde appears in the urine. The whole problem of urinary antisepsis by hexamine in these cases depends upon the ability to render the urine acid. Any urine that shows a well-marked red reaction with litmus will usually be definitely positive to the formaldehyde test.

3. As to the effect of alkaline urine on bacterial growth, Walker reasons that the use of alkaline in pyelitis and other genito-urinary infections has no good bacteriological basis and will give only temporary relief. Further study of the clinical history of these cases shows that they continue to progress and that the alkaline treatment offers no permanent cure, and he believes has a neutralizing effect on the acid toxine or endotoxine produced by the bacteria.

4. As regards the effect of diluents and dilute urine on the action of hexamine, diluents inhibit

the effect of formaldehyde in the following manner: (1) The amount of urine excreted is very much greater and the amount of hexamine needed is therefore very much greater. (2) In many of these cases the urine is alkaline and hence hexamine does not produce its proper effect.

5. Walker believes that most of the idiosyncrasies in regard to the formaldehyde series are due to alkaline urine and may be obviated by proper preliminary treatment of the urinary tract.

The relation of the foregoing facts to clinical work are considered as follows:

1. In acute bacillus coli infection, the author recommends an alkaline treatment of the urinary tract before resorting to hexamine. Then the hexamine should be given to the limit of the tolerance of the patient. The same principles hold with respect to either the kidney or the bladder.

2. In alkaline cystitis the urine should be made acid or at least acid sodium phosphate or sodium benzoate should be given with hexamine.

The author concludes with a discussion of the prophylactic value of hexamine and says: "I would advise, therefore, that the urinary tract be prepared by a course of antiseptics, just as the bowel is prepared by aperients before all operations where interference with the bowel or pelvic organs is probable, and that this be made a routine before parturition."

A. C. STOKES.

#### Lefort, A.: Gonorrhœal Infection of the Urethral Glands. *N. Y. M. J.*, 1916, ciii, 790.

Lefort's paper is written from the general practitioner's standpoint. He traces the history of urethral folliculitis through its acute and subacute stages to the chronic. He points out that acute folliculitis always accompanies acute infection of the urethra. The subacute form, he points out, can often be recognized by palpation along the urethra and determination of small painful tumors about the size of shot embedded in the urethral mucosa. They may attain the size of a pea. They are not attached to the skin, but occupy the inferior aspect of the urethra. The passage of an olive-tip bougie causes pain as it passes over these projections into the lumen of the urethra. When it is pushed beyond them, pus and blood will always be found on the heel of the instrument.

The chronic form of folliculitis is the most attenuated form of this lesion. The author suggests that it may end in one of the following ways: (1) periurethral abscess, (2) urethral fistula, and (3) stricture. After a time, folliculitis will react on surrounding tissue, producing a progressive sclerosis. The author states that most cases of folliculitis end in resolution and disappear, but they may take on a torpid evolutionary existence and persist for a long time if proper treatment is not instituted. He recommends electrolysis and intra-urethral cauterization as the best means of treatment.

A. C. STOKES.



**Shallenberger, W. F.: Chronic Urethritis in Women; a New Method of Diagnosis and Treatment in Obscure Urethral Pain.** *J. Am. M. Ass.*, 1916, LXVI, 1011.

Chronic urethritis in women is much more common than is generally recognized. The symptoms are not always typical and may not be referred directly to the urethra, but when a woman complains persistently and consistently of symptoms in the region of the pelvis, the urethra should not be overlooked as a possible source of the trouble, especially if no other pathologic condition can be found.

The most constant symptoms are frequent and painful urination, usually burning, and there may even be vesical tenesmus. All degrees of these symptoms are seen. In the severer cases there may be a more or less constant pain of throbbing character in the region of the urethra or vagina. Some patients will have sharp, lancinating pains in the urethra. Reflex pains may be present, referred to the vagina, uterus, coccyx, rectum, etc.

Treatment is best carried out by direct application of silver nitrate to the mucosa through a cystoscope or vesical speculum. The author uses a 5 per cent solution as a rule, but sometimes uses as strong as 10 per cent, and has used a 20 per cent solution once or twice over limited areas. The treatments should be repeated every three to five days. Dilating the urethra with sounds or dilators, in addition to the other treatment, is often beneficial, and gentle massage along the urethra while the dilator is in place. It usually requires from four to eight applications of the silver nitrate to effect a cure, though some patients require many more than this.

The new method of diagnosing and treating a painful urethra is that of nerve-blocking. It is blocked off by a solution of novocaine, 0.3 per cent, with quinine and urea hydrochloride, 0.5 per cent, injected into the para-urethral tissue.

EDWARD L. CORNELL.

**Légueu, F.: Venous Autoplasty of the Traumatized Urethra** (L'autoplastie veineuse de l'urètre traumatisé). *Presse méd.*, 1916, p. 137.

Since 1909, when Tanton proposed venous transplantation in autoplasmic urethral operations, the cases published do not indicate that the method is advantageous.

In spite of experimental proof that the graft would take, preserve its caliber, and change its endothelium into stratified epithelium, in all cases in which it was tried, there was total or partial disunion, elimination of the graft, persistence of the fistula, and return of the stricture. Therefore, Lériché, in 1911, stated that there was not a single surgical fact proving absolutely the success of a venous graft; and came to the conclusion that there was really no indication for venous autoplasty of the urethra.

Légueu now reports re-examining a soldier on whom three years previous he had made a venous autoplasty for traumatic stricture of the urethra.

The immediate result was excellent and the autoplasty is still so excellently maintained that the man has re-entered military service. This result, which establishes the first success of a venous autoplasty, deserves to be published at this time when the multiplicity of wounds of the urethra obliges surgeons to utilize all possible measures to combat the frequently complicated deformities.

In the operation referred to, which was done in June, 1913, the graft was taken from the saphenous vein, which was exposed near Scarpa's triangle for a length of 15 cm., ligatured, and sectioned. The examination 20 months later showed that the urethra was perfect as regards caliber and could receive a large sized catheter. There was no tendency toward stricture, which is a most important point.

This venous transplantation was only attempted after extensive perineal urethrostomy. When an exact adaptation of the mucous to the skin has been effected, stagnation of urine, infiltration, and infection are avoided. But in order that the procedure should give the best results, it is necessary that the urethral orifices should be in perfect continuity with the skin. Six months may have to elapse before proper results are obtained from the urethrostomy and then the transplant may be effected. If done earlier there is always the chance of infiltration or infection and the consequent danger of disunion.

W. A. BRENNAN.

## GENITAL ORGANS

**Phocas: Vaginal Hydrocele Operated upon by the Inguinal Route; Varicocele Operated upon by High Suspension of the Testicle** (Hydrocele vaginale opérée par la voie inguinale; varicocele opéré par la suspension haute du testicule). *Bull. et mèm. Soc. de chir. de Par.*, 1916, XLII, 818.

Phocas reports a modification of the operation for hydrocele which he has used with good results. The modification consists in performing the operation (vaginal eversion or resection) by incising through the inguinal region and luxating the testicle from above. There are many advantages in making the incision on skin which can easily be made aseptic and in keeping the scrotal sac intact and allowing the patient to get up early. The hydrocele must first be reduced either by a prior scrotal puncture or by puncture made through the inguinal incision.

Phocas has used this procedure for four years and the end-results are excellent. He has never had to make a subsequent intervention and the patients have all been well satisfied.

W. A. BRENNAN.

**Maylard, A. E.: The Inguinal Incision for Intra-scrotal Affections.** *Brit. M. J.*, 1916, I, 589.

The inguinal incision has been frequently used for excising a portion of the pampiniform plexus in varicocele, but there has been no mention of its employment for dealing with hydroceles and testicular affections of limited proportions.

The author's chief reason for using the inguinal

incision is to avoid an incision into the scrotum. He believes that it is difficult to sterilize the skin of the scrotum because of its anatomy and because among the ordinary run of hospital patients it is deeply ingrained with "dirt." He calls attention to the readiness with which the scrotum sweats when confined under a dressing. The difficulty in attempts to render the skin surgically clean with carbolic acid or iodine lies in the curious susceptibility of the skin of this area to these disinfectants. Another important reason for avoiding the skin of this area is the extreme degree of venous vascularity of the scrotum. The laxity of the tissue makes it difficult to secure the vessels by ligation. Moreover, there is no way by which the pressure necessary to control hæmorrhages can be obtained as in operation on other parts of the body. In the author's experience, all of these drawbacks can be overcome by approaching the scrotum through an inguinal incision. As it is not always possible to have a completely dry field, he advises that a drainage tube be inserted down to the bottom of the scrotal cavity and suggests that to facilitate drainage the scrotum be raised and supported on a thin wood or cardboard shelf. In conclusion, the author states that the inguinal approach to the scrotal receptacle, especially for hydroceles and testicular affections of reasonable proportions, seems worthy of wider recognition.

G. J. THOMAS.

#### MISCELLANEOUS

**Churchman, J. W.: The Diagnosis of Genito-urinary Tuberculosis.** *Med. Rec.*, 1916, lxxxix, 511.

Churchman gives an outline of the important factors in diagnosing tuberculosis of the genito-urinary organs, discussing each point clearly and intelligently, and he also speaks of the route taken by the organisms in reaching the urine from the blood. By means of diagrams he describes the difficulties in determining the much-mooted question of infection via the ureters or the blood stream.

He states that it is well established that the kidney is somewhat impermeable to organisms, although the establishment of this conclusion beyond any doubt probably is impossible; he also emphasizes the need of overcoming the popular misconception that infection is carried from the bladder to the kidney, and shows by clinical experiences that tuberculosis by continuity from bladder to kidney is so rare as to be excluded from consideration.

The first important point is that renal tuberculosis may occur in a person otherwise healthy; second, in renal tuberculosis, renal symptoms are the exception and not the rule; third, an impalpable kidney not only is no indication of the absence of renal tuberculosis, but also is no proof of the absence of an enlargement of the kidney from this disease.

The dependable sign is the presence of tubercle bacilli in the urine, nevertheless the author had three cases, all proven to be tuberculosis of the kidney by microscopic examination of the tissue removed, in none of which were tubercle bacilli demonstrable in the urine, yet these experiences are exceptional.

The author feels that further studies should be done on the Much granules, as these bodies were found in one of his specimens. He also urges the palpation of the lower end of the ureter *per vaginam*, in the female, as the readiness with which an enlarged ureter can thus be felt is surprising. In cases where it is difficult to catheterize the ureter, although it is readily seen, and probably due to the fact of entering the bladder at an unusual angle, he has overcome this difficulty by passing the right catheter into the left side, and vice versa. The X-ray has been of little value, except in the type which is characterized by the presence of calcified nodules in the kidney. Animal inoculations are unsatisfactory, so he affirms, as it takes too long, especially in hospital cases.

LOUIS GROSS.

**Herbst, R. H.: Complications of Acute Gonorrhœa in the Male.** *Urol. & Cutan. Rev.*, 1916, xx, 194.

The author discusses the various complications of acute gonorrhœa in the male and describes the treatment for each. He emphasizes his belief that in the large majority of cases the infection penetrates to the posterior urethra and consequently the prostate and vesicles become involved. He feels that too much attention in the past has been paid to the treatment of the urethra and too little to the vesicles from which the urethra is constantly reinfected. In cases where there is no obstruction in the vas the author believes in vasostomy followed by injections of collargol into the vesicles. He thinks vesiculotomy and vesiculectomy should be reserved for the more severe cases where access cannot be had to the vesicles by the more simple method of vasostomy.

As a means of prophylaxis in epididymitis the author has found it possible to prevent the apparently impending attack by making an incision in the vas midway between the pole of the epididymis and the external ring. If this is done early, at a time when the patient complains of pain in the inguinal canal and before there is swelling of the cord or definite evidences of epididymitis, the involvement of the epididymis may often be prevented. In the more severe cases of epididymitis where it is necessary to do epididymotomy the author at the same time that he makes an incision in the epididymis also takes up the vas, opens it, and injects the vesicle through this opening with collargol. He considers this the logical procedure in view of the fact that an infection of the vesicles must precede every epididymitis.

H. L. SANFORD.



# SURGERY OF THE EYE AND EAR

## EYE

**Arboleda, A.: Suture of the Cornea in the Cataract Operation** (Observaciones de sutura de la cornea en la operacion de la catarata). *Repert. de med. y cir.*, 1916, vii, 195.

A frequent accident in operation for the extraction of the cataract is hernia of the iris through the sclerocorneal incision. Williams of Boston in 1867 proposed a suture of the cornea in extraction of the crystalline, but it was Soarez and Vacher and Kalt who put the method into practice.

Arboleda reports a case carried out according to Kalts' technique with slight modifications. He thinks that some such procedure is necessary, owing to the great suffering which many cataract patients undergo, sometimes accompanied by pulmonary complications which render a prolonged intervention insupportable. The results after ten months of observation are exceptionally good, and the author has also obtained equally good results in some later cases.

He is of the opinion that suture of the cornea is indicated in persons who on account of age or the condition of the respiratory apparatus cannot tolerate a long intervention in the dorsal decubital position.

W. A. BRENNAN.

**Cassimatis: The Ocular Wounds of War** (Des blessures oculaires de guerre). *Clin. ophthalm.*, 1916, vii, 29.

Cassimatis reports his experiences with eye injuries in the Balkan War of 1913 and during the present war. These injuries, though frequent enough in the Balkan War, were not so numerous as in the European War, as trench warfare and hand weapons were not then so frequently employed. Most injuries are due to shells or to the splintering of stones due to shells. He has only seen one case of injury by a rifle bullet, which having burst the eyeball lodged in the profundity of the orbit. Shell wounds most frequently produce direct or lateral penetrating wounds of the eyeball with traumatic cataract, prolapse of the iris, intra-ocular hæmorrhage, etc.

Another frequent class of injuries is the lodgment of foreign bodies in the sclerotic, the conjunctiva, or the cornea, due to the bursting of the cupronickel envelope of the rifle bullet when it strikes on a rock and is shattered into small pieces.

Cassimatis reports two cases in which there was no immediate lesion of the eye. One was a typical paralysis of the great sympathetic on the right side with a depression of the upper eyelid and involvement of the conjunctiva, etc., consecutive to an injury of the cervical sympathetic. The second

case was a double-descending optic atrophy following cerebral lesions produced by shell concussion.

W. A. BRENNAN.

**Rauch, R.: Ophthalmological Errors in the Field** (Ophthalmologische Fehlgriffe un Felde). *Berl.klin. Wchnschr.*, 1916, liii, 113.

The author calls attention to the error made in bandaging one or both eyes in inflammatory conditions, such as an inflamed lachrymal sac. The bandage only causes retention of pus, etc., and may cause a supplementary inflammation of the lids. The author thinks that the natural projections of the lids, the mechanism being particularly active in inflammatory conditions, is sufficient. Bandaging, however, is necessary in case of a foreign body or a one-sided gonorrhœa. He thinks the wearing of dark glasses in blepharospasm is a mistake and that exposure to the sunlight is preferable.

Cocaine used as a mydriatic is an error which is common and dangerous. Atropine or scopolamine should be used. Cocaine may be used in iritis. In operative procedures the author considers that exentration has many advantages over enucleation, except where the remnants of a destroyed bulbus must be removed. The technique of exentration is simpler and there is less danger of meningitis. A strip of gauze is passed into the sclerotic cavity after enucleation; a compress is applied to prevent inflammatory protrusion of the stump, but is removed after two days.

W. A. BRENNAN.

**Rollet, E., and Mangini, L.: Injuries of the Deep Membranes of the Eye in War, with Integrity of the Ball** (Lésions des membranes profondes de l'œil par blessures de guerre avec intégrité du globe). *Clin. ophthalm.*, 1916, vii, 69.

Injuries of the head and face have become more frequent since the war has developed into trench fighting. Thus in August, 1914, 5 per cent of the wounds observed involved the face, while in January, 1915, this percentage had increased to 13 per cent. The eyeball is particularly susceptible; a fragment which elsewhere makes an insignificant injury if it penetrates the eye disorganizes it.

The authors, however, have observed the large category of cases in which the patients have suffered a loss of acuity of vision without showing any apparent eye lesion. Casual inspection shows nothing, but a methodical ophthalmoscopic examination very often shows hæmorrhages and ruptures of the deeper membranes of the globe. The authors find that about 6 per cent of the cases coming to them are of this character, presenting retinal or choroid lesions with global integrity.

The authors discuss these lesions under the headings of retinal separations, choroid ruptures, and retinochoroid hæmorrhages and consecutive lesions. Of 96 cases, 34 belonged to the first class, 22 to the second, and 33 to the third. W. A. BRENNAN.

### EAR

**Lubman, M.: Otitis Externa.** *Med. Times*, 1916, xlv, 118.

The author calls attention to the differential diagnosis between otitis externa and acute otitis media with mastoid involvement. The importance and necessity of recognizing the differential points lies in the fact that the latter condition demands immediate surgical interference.

The differential points are tabulated as follows:

*Otitis media with mastoid.*

1. Very common in children.
2. Mostly secondary from nasal or retronasal space, or through involvement of the eustachian tube.
3. Pain deep in the ear.
4. Temperature 103-104°.
5. No pain at all.
6. Not painful.
7. Deep pressure painful, superficial pressure not painful.
8. A late symptom.
9. Canal never swollen except when secondarily infected.
10. No pain.

*Otitis externa.*

1. Quite rare in children.
2. Due to mechanical irritation, as cleaning the ear with a hairpin, a match, and consequent infection.
3. Pain is more or less localized around the ear.
4. Temperature 100-101°.
5. Pulling the auricle up and down, painful.
6. Mastication, painful.
7. Superficial pressure upon the mastoid, very painful; deep pressure, less painful.
8. Swelling in front and back of the ear, an early symptom.
9. Swelling of canal is typical.
10. Pressure upon the canal in the post-auricular fold will give pain.

OTTO M. ROTT.

**Barnes, J. H.: Lateral Sinus Thrombosis.** *South. M. J.*, 1916, ix, 363.

After referring to the anatomy of the sinus, the author discusses the subject of sinus thrombosis, mentioning the etiology, symptomatology, pathology, and treatment. He then reports a case

of brain abscess with local meningitis which was diagnosed as lateral sinus thrombosis, also as a severe middle-ear infection and mastoiditis.

The patient, a boy, aged 14 years, had an attack of acute otitis media and mastoiditis with high fever, 102° to 105°, and severe headache. On the fifth day the ear ceased to discharge and the ear drum bulged. As opening the drum did not produce a discharge nor relieve the symptoms, and as the temperature suddenly dropped from 105° to 101° and in a few hours was 105° again, the mastoid was opened and the lateral sinus found bathed in pus. The jugular vein was ligated and clot from the sinus was removed. In spite of this, pain and high fever continued. He had no chills, but he now began to have sweats and to breathe very rapidly. On the fifth day after the operation the right external rectus became paralyzed; the pupil did not react to light, and he died on the eighth day after the operation. The temperature was 107° just before death. No tests were made to confirm the diagnosis of brain abscess with meningitis and no autopsy was made, the diagnosis being made by exclusion.

OTTO M. ROTT.

**Pfister, F.: The Work of Robert Barany on the Semicircular Apparatus of the Ear and the Cerebellar Localization as the Diagnostic Key to the Different Intracranial Conditions.** *Wis. M. J.*, 1916, xiv, 468.

The author refers (1) to the Barany or caloric tests of the semicircular apparatus to determine their irritability by means of the resulting nystagmus and (2) the influence on the pointing test by irritation of the semicircular canals. Barany has evolved the theory that while the cerebral hemisphere furnishes innervation for muscular power the cerebellum is the organ of control for such motion or the center for co-ordination, and that through the vestibular apparatus this can be proved. He followed out the suggestion of Bolk, of Holland, that there must be motion centers in the cerebellum. He found that, after irritating the semicircular canals or stimulating them with hot or cold water, the patient who could point his index-finger with extended arms at the examiner's fingers and lower the arm with his eyes closed and raise them again, trying again to touch the fingers, would have the nystagmus to the one side and his finger would deviate in the opposite direction. The test of pointing the finger to one's nose, as well as Romberg's test for equilibrium, was known before. But Barany, through these tests, put all these things into system and law, so that certain directions must follow in the manifestations in certain kinds of stimulation.

OTTO M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Canuyt, G.: Wounds of the Nose, the Nasal Fossæ, and the Accessory Cavities in Time of War** (Les blessures du nez, des fosses nasales et des cavités accessoires en temps de guerre). *J. de méd. de Bordeaux*, 1916, lxxvii, 73.

The author writes of experiences in the otorhinolaryngological service of the 18th Legion stationed at Bordeaux. In this center 6,500 cases were examined during January, 1915.

Experience has shown that in wounds of the nasal fossæ it is indispensable that all such should early be placed under the care of a specialist for treatment in order to avoid cicatricial synechia. During the period of reparation and before cicatrization takes place, traumatic frontal sinusitis should be operated upon after the wound is evacuated and the infection has subsided; never before. The treatment is by curettage of the anterior ethmoid and of the nasofrontal canal. If this is not sufficient, recourse must be taken in a radical operation terminated by nasofrontal drainage.

In the case of traumatic maxillary sinusitis, operation must always be done if there is a projectile present. A radical cure can be effected by the Caldwell-Luc method, modified or not, with or without a facial plastic operation. Local anæsthesia suffices in all cases. W. A. BRENNAN.

## THROAT

**Landa, G. M.: Infra-epiglottal Cysts** (Nota sobre los quistes infra-epigloticos). *Rev. de med. y cir. de la Habana*, 1916, xxi, 97.

The cyst is one of the most rarely found benign tumors of the larynx, and Landa reports one recently observed in a man of 27. The laryngoscope showed the tumor to be situated in the base of the posterior part of the epiglottis and between it and the vocal cords. It was smooth, bland, depressible, and pediculated, and in color was whitish-gray with vascular arborizations on the surface. It was easily extirpated under local anæsthesia and with only a slight hæmorrhage. W. A. BRENNAN.

**Beer, E.: Paper Clip in Bronchus Seventeen Years Removed by Superior Bronchoscopy.** *J. Am. M. Ass.*, 1916, lxxvi, 739.

Seventeen years ago the patient was playing with a paper clip which he had put into his mouth, when it suddenly became lodged far back in his mouth near the base of his tongue. His father, with the use of an ordinary teaspoon made an attempt to remove the clip, but, unfortunately, pushed it still

farther down the patient's throat. The patient felt much better and did not notice any particular distress and his parents believed that he had swallowed the clip.

At various times he was treated for pneumonia, bronchitis, bronchial asthma (12 years), and tuberculosis. On admittance to the Bellevue Hospital an X-ray examination showed a distinct shadow of a flat-headed paper clip in the right main bronchus, with head down. It also showed marked thickening of the adjacent pulmonary tissue. Superior bronchoscopy was performed and the clip removed under combined ether and cocaine anæsthesia. The clip was embedded in the granulation tissue which almost filled the bronchial lumen, and there was copious discharge during the manipulation.

Four months later a roentgenogram showed marked improvement in the pulmonary condition, though considerable thickening was still present. The patient still had a moderate cough and some expectoration, undoubtedly due to the bronchiectasis that had developed from the paper clip remaining *in situ* for 17 years. EDWARD L. CORNELL.

**Henessy, J. T.: Views on the Tonsil Question.** *Hosp. Bull. Univ. Md.*, 1916, xii, 6.

The author considered the conditions indicating removal of the tonsils under two heads: (1) the general indications and (2) the localized indications.

Of the former, three are mentioned: (1) a general run down condition of the child who has hypertrophied tonsils and adenoids; (2) cervical adenitis; (3) the rheumatic group of infections.

The localized indications mentioned are: (1) obstruction to breathing; (2) sore throat; (3) suppurative and non-suppurative diseases of the ear. OTTO M. ROTT.

**Hudson-Makuen, G.: The Conservative Treatment of the Tonsils.** *N. Y. M. J.*, 1916, ciii, 483.

The fact that a normal tonsil is probably a protection, that its presence is helpful in both phonation and articulation, and that its systemic and mechanical functions are unknown are arguments in favor of conservatism rather than radicalism in its treatment.

The author states that it is easier to remove a tonsil than to know whether or not it should be removed, and he thinks the tendency of the future will be to determine not how to operate, but how not to operate, or at least how to operate in the most conservative manner. ELLEN J. PATTERSON.

**Lapat, W.: A Modification of the Sluder Method of Tonsil Enucleation.** *J. M. Ass. Ga.*, 1916, v, 185.

The author describes his modification of the Sluder guillotine in the right hand and puts it obliquely across the buccopharyngeal cavity with the fenestrum engaging the right tonsil from below upward. With the left forefinger at the middle of the anterior pillar, he massages the tonsil into the hole until three-quarters of the tonsil is within the forceps; presses down the cutting edge without cutting the tonsil through; puts the tonsil on the stretch by pulling the instrument forward, and completes the dissection with the left forefinger, beginning at the superior angle of the fossa.

The advantages of the method are: ease and speed in performing the operation; avoidance of unnecessary hæmorrhage, venous and arterial; preservation of the pillars; and rapid convalescence.

ELLEN J. PATTERSON.

**Manges, M.: The Occurrence of Abscess of the Lung After Tonsillectomy.** *Am. J. Surg.*, 1916, xxx, 78.

Of the 9 cases reported, one died (probably two, as one left the hospital against the advice of the physician after only a week's stay, and his condition at that time was very grave). The symptoms of lung abscess appeared on the first day in two cases; on the second, third, and fifth day in one case each; on the seventh day in two cases; and on the tenth and fourteenth days in one case each. As contributory factors to the occurrence of these complications, the author states that either the patient is allowed to go home too soon, or the patients may not have been observed carefully before the operation. They may have had a little fever, or a cough, or some slight ailment, which might easily have escaped notice unless a careful examination had been made at the time.

To guard against these factors it is advised (1) that these patients should have the same preliminary examination as patients who are to undergo major operations; (2) that they receive more after-treatment; (3) that three days in the hospital should be the shortest stay demanded for them; and (4) more attention should be given to the important details of the anæsthesia, posture, and the suction apparatus.

The author considered this complication as avoidable and one that should never occur if the patient receives proper treatment.

Five factors are mentioned as causing the infection:

1. The anæsthesia (but this is considered very remote).
2. Aspiration of infected blood or of pieces of tonsillar tissue. (This is given most weight by the

author; and is considered the actual factor in those cases in which the symptoms develop immediately, or one or two days after the operation.)

3. Embolism or infarction of the lung.
4. Some special infective agent.
5. Some antecedent cause, either local or general.

OTTO M. ROTT.

**Pardo, S. Y.: Retropharyngeal Abscess Discharging into the Left Bronchus** (Absceso retrofaringeo vaciado en el bronquio izquierdo). *Rev. méd. de Sevilla*, 1916, lxvi, 106.

The author describes a pharyngeal abscess which occurred in an infant. The asphyxiated condition, absolute impermeability to respiration, and tachycardia necessitated immediate intervention. The tumor was found to have become detached from the laryngeal mucosa and to have discharged spontaneously into the left bronchus. The child died in collapse.

W. A. BRENNAN.

## MOUTH

**Parker, D. B.: Infections of the Mouth, Ear, Nose, and Throat as Primary Foci for Secondary Infections.** *Long Island M. J.*, 1916, x, 97.

The author has been making a careful study of the organisms obtained from infections about the teeth at the New York Post-Graduate Hospital and invariably finds the streptococcus viridans present at the apices of nearly all infected roots of teeth.

At this hospital it has become almost a routine procedure to refer all cases of anæmia, endocarditis, gastro-enteritis, and arthritis, in which oral infections are evident or obscure, to the department of oral surgery for examination and treatment of the oral lesions. Roentgenograms, in the form of films or plates, are taken of the teeth as a preliminary procedure. These cases are almost invariably found to have chronic apical abscesses at the roots of all dead teeth.

After removing all infected foci in the mouth, they invariably supplement the treatment by the systematic employment of autogenous vaccines. The major portion of these cases are remarkably benefited by this treatment. If the oral infections are the only foci and the secondary lesion has not been of too long standing, the response is fairly rapid.

The hospital has had two cases in the past six months of exophthalmic goiter in which marked oral infections were present. The elimination of the infections, combined with the use of autogenous vaccines, has helped these two cases materially; that is, the tachycardia and tremor have decreased, as well as the optic protrusion and enlargement of the thyroid glands. One of these patients had an empyema of the maxillary sinus which was opened and drained. After five months' treatment, the patient says her condition is better than it has been in years and the extreme neurotic symptoms



which were present have practically entirely disappeared. Just what connection there is between exophthalmic goiter and oral and sinus infection; the author is not in a position to state.

EDWARD L. CORNELL.

**Stincer, R.: Ligature of the Lingual Artery in the Triangles of Beclard and Pirogoff** (La ligadura de la arteria lingual en los triangulos de Beclard y Pirogoff). *Rev. de med. y cir.*, Habana, 1916, xxi, 149.

It is admitted that the ligature of the lingual artery comprises two distinct portions: (1) it occupies the retrodigastric area of Beclard's triangle; (2) it corresponds to Pirogoff's triangle in the intra-digastric zone.

According to Picqué, in cases of cancer of the tongue, it is better to ligate the external carotid than the lingual artery.

The author performed a dozen dissections of the suprahyoid region, and gives the following observations: The lingual artery reaching the triangle of Pirogoff has given out all its collateral branches so that the results of a ligature at this point are nil. The sublingual branch, given out prematurely, may be taken for the main artery.

Behind the digastric, in the triangle of Beclard, the lingual artery descends toward the median constrictor of the pharynx, and is found covered by the posterior portion of the hyoglossus inserted in the large horn of the hyoid. At this level it gives out a very important collateral branch, the dorsal lingual artery. The author has seen cases in which the lingual and the facial arteries formed a common trunk. Going a little deeper one runs the risk of striking the superior laryngeal nerve or the pharynx. As to the organs forming the triangle of Beclard, the author discovered certain contradictions in the descriptions of different authors. The posterosuperior margin of Beclard's triangle is formed by the big hypoglossal nerve; the inferior margin by the great horn of the hyoid; the anteroposterior margin by the

posterior wall of the digastric, according to Testut, and the hyoid eminence, according to Poirier.

Dissection of the suprahyoid region demonstrates that the idea is erroneous, given the direction followed by the great hypoglossal nerve, parallel to the great horn of the hyoid, as two parallel lines cannot unite to form a triangle.

The conclusions drawn are:

1. It is absurd to ligate the lingual artery in the triangle of Pirogoff.

2. Ligature in the triangle of Beclard is dangerous and of very doubtful results.

3. Ligature of the artery at its origin is the only reasonable course.

RAOUL L. VIORAN.

**Neuhof, H.: Sialolithiasis and Sialodochitis in Childhood.** *Am. J. Dis. Child.*, 1916, xi, 232.

Sialolithiasis in childhood cannot be termed the exceedingly rare, almost unknown condition it is presumed to be. The manifestations are more clean-cut and evident in children than in adults; the diagnosis can be made more readily; and the surgical treatment is simple and efficacious. The salivary duct should be probed in every instance of enlargement of a salivary gland in a child when a definite cause for the enlargement cannot be ascertained.

There is a hitherto undescribed form of sialodochitis of Stenson's duct in children, secondary to inflammation of unknown origin, leading to an enlargement of the parotid gland that can be readily mistaken for sarcoma or mixed tumor. The gland is considerably increased in size; is firm, nodular, and adherent; the orifice and buccal end of the duct are embedded in stenosing cicatricial tissue. There is a tendency to repeated recurrences of the parotid swelling after slitting the mouth of the duct, but cure promptly follows the excision of the diseased end of the duct.

Three cases of sialolithiasis and two cases of sialodochitis are reported. The oldest patient was eight years of age.

EDWARD L. CORNELL.

# BIBLIOGRAPHY OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

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## GYNECOLOGY

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# INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1916

## COLLECTIVE REVIEW

### CONGENITAL MALFORMATIONS OF THE NECK

By GEORGE DE TARNOWSKY, M.D., F.A.C.S., CHICAGO  
Attending Surgeon, Cook County and Ravenswood Hospitals

#### HISTORIC

ACCORDING to V. A. Funk (8), to Ascheron, in 1832, must be given the credit of first discovering that congenital cysts and sinuses of the neck had a definite connection with aberrations of foetal branchial clefts. Somewhat later Roser and Koenig reinvestigated the same subject and confirmed Ascheron's findings. Lilienthal (11) and DaCosta (22) credit Mayer, in 1833, with the first comprehensive report on carotid body tumors, although Luschka, in 1862, so popularized the subject that this body is now very generally known as Luschka's gland. After a most careful perusal of the literature, the reviewer has failed to find the original authors who first classified cystic hygromas, lymphatic cysts, hæmorrhagic cysts or teratomata of the neck among tumors of congenital origin. Exact knowledge of these malformations appears to have been acquired through a slow process of medical evolution. Giacomo (32) believes that Wegner should be given credit for describing cystic hygromata of the neck in 1877.

#### FREQUENCY

Burke (7) makes the statement that thyroglossal cysts occur with comparative frequency, Dowd (51), in looking over the records of the New York Surgical Society, found no report of a complete branchiogenic fistula, thus indicating its comparative rarity. The records of the Cook County Hospital of Chicago, from 1909 to 1916, reveal 8 cases classified under the heading of "congenital malformations of the neck." A

careful analysis of these 8 cases compelled the reviewer to reject 6 of them, the clinical history, operative findings, and lack of pathological report, all speaking against their embryologic derivation. One case, a doubtful branchial cyst, was a "fluctuating circumscribed swelling, the size of an almond, lying subcutaneously over the center of the right sternomastoid muscle." At operation the tumor was found within the sheath of the muscle; but there is no mention of any obliterated duct proximal or distal to the tumor, and no pathologic report is attached to the case history. The eighth case was an undoubted thyroglossal cyst. McKenty (13), reviewing the records of the Royal Victoria Hospital for ten years (1904 to 1914) was more fortunate, being able to tabulate 15 branchiogenic cysts, 5 branchiogenic carcinomata, 9 thyroglossal cysts, and 1 carotid body tumor—a total of 30 cases. Collison and MacKenty (9) were able to collect 60 cases of carotid body tumors in the literature up to 1913. Of these 60 cases, 4 had merely been accidentally found at autopsy and 2 had been examined post-mortem, the nature of the growth not having been recognized ante-mortem. Dowd, up to 1913, collected reports on 91 cases of cystic hygroma of the neck, and only 35 cases involving the axilla or pectoral regions.

From a careful analysis of cases reported to date, it becomes self-evident that, in general, the diagnosis of congenital malformation was only arrived at after the operation. In the case of congenital cysts, only a microscopic examination of the epithelial or endothelial lining of the cyst-

wall will reveal the true nature of the tumor. Clinically, a definite diagnosis of congenital fistula can only be made when it is either complete, i.e., extending from the pharyngeal wall or foramen cæcum to the lateral or anterior surface of the neck, or of the incomplete internal or incomplete external types, i.e., opening either on the surface of the neck or in some portion of the pharynx. A pre-operative differential diagnosis between a true branchial or thyroglossal cyst (closed at both ends) and a hygroma cysticum colli, would appear to be impossible.

#### CLASSIFICATION

The classification of embryologic malformations has never been placed on a firm basis. Each author has apparently been content to work out his own "scheme," with little or no regard to previous publications. Thus, O. C. Smith (6), in his otherwise splendid classification of tumors of the neck, includes angiomas, hygromata, and dermoids of the neck under neoplasms and not among embryologic malformations; Murphy (2) classes the above under the proper heading but includes carotid body tumors among "malignant diseases" of the neck. He also classes hygromata as bursal cysts. Smith classifies carotid body tumors under the heading "tumors of special organs." Branchiogenic cysts are classified by the same author under two heads, (1) congenital (2) malignant, which is needlessly confusing. Kirmisson (14) divides all congenital cysts of the neck into (1) serous, (2) dermoid, (3) mucoid. His serous cysts are evidently hygromata, for he describes them as "large, multilobulated, extending from the lower jaw to the clavicle and from the median line almost to the spinous processes of the vertebræ." There may be as many as 100 pockets in one tumor. These tumors have a tendency to penetrate muscles (pseudo-malignant); they may even pass under the clavicle and form axillary cysts, or under the manubrium to the anterior mediastinum. He considers the etiology of serous cysts under two headings: (1) venous, because of their frequent intimate connection with the interior jugular vein and the clinical fact that the contents of the cyst is frequently bloody; (2) lymphatic, because of the dilatation of surrounding lymph channels. Dowd (10), writing on the subject of cystic hygromata of the neck, states that three types of growths have been included in some of the descriptions (in medical literature): (1) cystic tumors which have endothelial linings and which grow with much power through the tissues of the neck or downward under the clavicle into the

axilla or pectoral region; (2) lymphangiomata; and (3) branchial cysts. He correctly maintains that only those of the first type should be called hygromata.

The following classification, based on embryologic, microscopic, and clinical data, has been compiled from the case reports to date.

#### 1. Branchiogenic:

- (a) Complete fistula (branchial fistula of Roser), patent both ends.
- (b) Incomplete fistula { Internal  
(Cystic fistula) { External
- (c) Branchial cyst, closed both ends, open in intermediate portion.

#### 2. Thyroglossal

- (a) Complete fistula (extremely rare).
- (b) Incomplete internal (rare).
- (c) Incomplete external (rare).
- (d) Thyroglossal cyst (usual type).

#### 3. Aberrant thyroid gland.

#### 4. Supernumerary thyroid.

#### 5. Lymphangioma (lymphangioma simplex and cavernosum).

#### 6. Hæmorrhagic cysts (hemangioma congenitum).

#### 7. Hygroma (hygroma cysticum colli congenitum).

#### 8. Dermoid cysts (in parotid gland, near floor of mouth, in thyrohyoid or submaxillary region), Kirmisson (14).

#### 9. Carotid body tumors { (a) Primary, benign. (b) Secondary, malignant.

#### EMBRYOLOGY

1. Branchiogenic fistula or cyst. In the development of the anterior part of the digestive tract, there are formed bilaterally symmetrical lateral diverticula which, pressing aside the lateral mesoderm of the head, come into apposition with corresponding invaginations of the ectoderm. The endodermal diverticula are termed pharyngeal pouches, while the ectodermal invaginations are known simply as branchial grooves. By pressing aside the mesoderm, the ectoderm and the endoderm for a time come in contact and fuse, forming the epithelial closing membrane, which breaks through in all forms that have a branchial respiration. The branchial grooves and pharyngeal pouches thus become continuous and together form the branchial clefts. Under normal conditions this fusion and breaking through does not occur in mammals. Between the branchial clefts are the branchial or visceral arches, each of which contains a skeletal rod, the cartilaginous branchial arch, its muscula-



ture, an aortic arch, and a nerve-trunk. The branchial arches are named in succession the mandibular, hyoid, and branchial arches proper. The first branchial cleft is also known as the hyomandibular cleft (Keibel and Mall, 57).

In a four-week-old human foetus there are four branchial clefts which correspond to the gills in the fish. All these clefts should become completely obliterated or, in other words, the arches or bars separating the clefts should coalesce (with the exception of the first cleft which forms, practically speaking, the canals opening into the pharynx), leaving the neck perfectly smooth. The auditory canal develops at the site of the first cleft (52, 53). The eustachian tube, the middle ear, and the external auditory meatus would really form a complete fistula but for the membrana tympani which represents the thinnest portion of the cleft and contains two layers of epithelium, one from the ectoderm and one from the endoderm. This "near" fistula is really very similar to the real fistulae which sometimes exist in the neck at the site of the second cleft. When maldevelopment of the first cleft occurs, it is apt to show itself by tabs in front of the ear or defects of the ear itself, and occasionally is associated with defective formation of the mouth (Dowd, 10). If nature fails in any of these particulars, there is produced a congenital fistula, a cyst, or both (Funk, 8).

The region that corresponds to the outer opening of the second branchial cleft is to be found at the anterior border of the sternomastoid muscle. The second pharyngeal pouch corresponds to the tonsillar depression; the openings of the third branchial cleft (pharyngobranchialis) are to be looked for near the larynx. A fistula of the second branchial cleft must lie, if the development of the vessels be normal, between the external and internal carotids and anterior to the glossopharyngeal and vagus nerves; a fistula of the third cleft, between the common carotid and vagus, as well as between the glossopharyngeal and superior laryngeal nerves, while a fistula of the fourth cleft must bend around the subclavian on the right and the arch of the aorta on the left, since these are derivations of the fourth aortic arch. So far, only fistulae of the second branchial cleft have been recognized with perfect certainty (57).

2, 3, 4. Thyroglossal fistulae or cysts; aberrant or supernumerary thyroids. Almost contemporaneously with the formation of the first pharyngeal pouch there appears the anlage of the thyroid gland. This anlage is recognizable before the first pharyngeal pouch has come into contact



Fig. 1. Incomplete internal branchial cyst and fistula. (De Tarnowsky collection.)

with the ectoderm, as a prominence in the ventral wall of the pharynx. It then becomes constricted to form a stalked vesicle, and its stalk, whose lumen becomes obliterated, persists for some time as an epithelial cord. The hollow stalk of the vesicle is the thyroglossal duct (57).

In a human foetus of five weeks, we find this small vesicle on the back of the tongue. By the eighth week the first trace of glandular tissue appears. This is the developing thyroid gland which begins to secrete as early as the fourth foetal month. The gland slowly passes down to its normal resting place through the thyroglossal duct, and this passage is obliterated behind it. Normally, nothing remains of this duct except the foramen cæcum, but when nature fails to do her duty a congenital abnormality is developed. If some of the thyroid cells are dislodged from the gland and remain along the duct, these may develop into accessory thyroids. The thyroglossal duct may fail to be obliterated, either partially

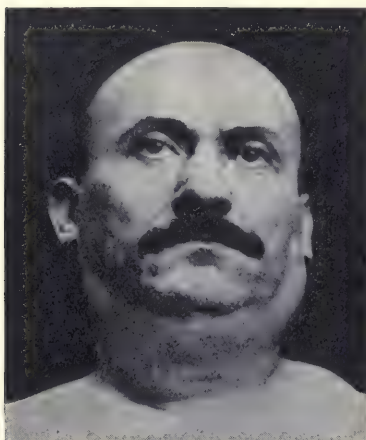


Fig. 2. Multiple lipomata. (Johnson's "Surgical Diagnosis," Vol. 1.)



Fig. 3. Branchiogenic cyst, New York Hospital. (Dr. Hartley.)

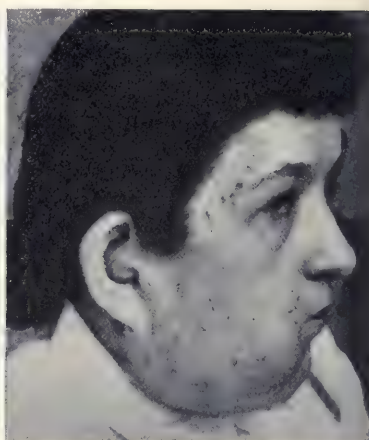


Fig. 4. Mixed venous and lymphangioma. (Johnson's "Surgical Diagnosis," Vol. 1.)

or totally, causing the existence of a fistula or cyst (8).

5. Lymphatic cysts (lymphangioma-cysticum). The first evidence of the formation of the lymphatic system is the development of symmetrical sacs in the neck, which have been called jugular sacs. These are first found in the human embryo as endothelial-lined sacs just lateral to the internal jugular veins. These jugular sacs become bridged or cut into by bands of connective tissue, this being the process by which each sac, originating from a plexus of blood-capillaries, is reconverted into a capillary plexus, lymphatic in character. Out of these lymphatic capillaries, chains of lymph-glands are evolved. The jugular sacs and thoracic duct may be termed a primary system; the secondary or peripheral lymphatics grow out from the primary system (Sabin, 58). Many of the lymphangiomata are found in connection with the sutures and fissures of the body. Thus we recognize macroglossia (tongue), macrocheilia (gums, lips), nævus lymphaticus (skin), etc.

6. Hæmorrhagic cysts. Since the human embryo, like that of all other vertebrates, possesses a row of definite gill bars or visceral arches, separated distinctly, externally by clefts, internally by entodermal pockets or pouches, so also its primitive vascular system is in conformity with this fundamental plan, and strong branches, connecting the dorsal and ventral aortæ—the aortic arches—each course in a visceral arch. Six of these aortic arches are recognizable in a human embryo 5 mm. long. Our present knowledge of the vascular system in the human embryo points to the fact that, normally, the first two

aortic arches are lost, as far as their actual arch portions are concerned, but the third and left fourth arches are retained, becoming the root portion of the internal carotid and aortic arch, respectively. Certain portions of the remaining arches are retained, forming parts of the carotids, the pulmonary arteries, etc.; the remainder of the arches normally disappear (57). Faulty retrogressive changes in a certain portion of one of these aortic arches account for the presence of congenital hemangiomas. Their situation always corresponds to embryonic lines of fusion, such as the facial or branchial clefts (59).

7. Hygroma. Embryologically speaking, a hygroma is probably the result of foetal sequestration of lymphoid rests (10). It has also been suggested that its origin may be from the intercarotid ganglion. Kirrison (14) thinks its origin may be either venous or lymphatic. On account of their pseudomalignant independent power of growth it has seemed best to consider hygromata as differing from lymphangiomas.

8. Dermoid cysts. Embryologically, both sequestration and tubulodermoids may occur in the neck. In the first instance, a portion of surface epithelium becomes pinched off and continues to develop beneath the skin surface. In the latter case a portion of embryonic canal (branchial cleft, thyroglossal duct) remains patent and a mixed dermoid results (60). Batut (23) restricts the use of the term "dermoide" to tumors of the neck containing ectodermic inclusions, classifying as "mucoides" those representing endodermic inclusion. Kirrison (14) also states that dermoids of the neck represent a retention of epidermal cells, whereas mucoid



cysts are lined with cylindrical epithelium, often possessing vibrissæ.

9. Carotid body tumors. There is little uniformity of opinion regarding the embryologic derivation of this "body," 5 mm. long, 3 mm. wide, and 2 to 5 mm. thick. Collison (9) states that it is "of doubtful embryological derivation, of undetermined function, inconstantly present, but occasionally giving rise to tumors of definite structure." Funk (8) believes it represents the remains of the upper part of the thymus anlage.

Many investigators, such as Zuckerkandl (38), McMurrich (39), Stilling (45), Kohn (46), Keith (47), and others, classify it with the "sympathochromaffin system anlage" which buds off from the central nervous system. Steide (48), Rabl (49), de Meuron (50), and others, maintain that it represents an embryonal rest from the third or fourth branchial cleft, while Kastschenko (42), Paltauf (43), and Monckeberg (44) look upon it as being a connective-tissue structure derived from the perithelium of the carotid arteries. It would, however, seem to be a well-established fact that this carotid body consists essentially of a loose connective-tissue capsule and meshwork, containing chromaffin cells similar to those found in the medulla of the adrenals, in the pituitary, and in the ganglia of the sympathetic nervous system. Physiologically, we have at present very little knowledge concerning this body. Experimentally, its action on blood-pressure is contradictory. The fact that it is not constantly present indicates that its function—if any—is unimportant. However, we must remember that the different parts of the chromaffin system, while of common embryology, possess different functions. Thus, the medulla of the adrenals affects blood-pressure, its cortex has an influence on the development of the sexual apparatus, the pituitary seems to possess a trophic influence, etc. (9).

#### PATHOLOGY

1. Branchiogenic fistula: (a) Complete. The proximal (internal) portion is lined with cylindrical epithelium (hypoblastic); the distal (external) portion is lined with flat pavement epithelium. The hypoblastic portion also contains a layer of lymphoid cells in its wall. The discharge consists of clear stringy mucus, or of a thinner, milky or turbid fluid resembling thin pus. It may also contain particles of fluid or semisolid food.

(b) Incomplete. The lining may be wholly of cylindrical epithelium, of flat pavement epithelium, or a combination of both varieties.

(c) Cysts. These have a wall of more or less dense fibrous tissue, containing lymphoid tissue

if the cyst arises from the inner embryonic layer. They are lined with pavement epithelium or cylindrical ciliated epithelium; sometimes with membrane containing all the structures of the skin. They are usually unilocular; occasionally multilocular. Their contents varies; it may consist of clear serous fluid, of mucus, of oily material, or of fatty material of solid or semisolid consistence. The walls may undergo suppurative or degenerative, even malignant, changes.

2. Thyroglossal: (a) Fistula. The deeper portion of the fistulous tract is lined by ciliated epithelium; that part nearest the foramen cæcum of the tongue with flat epithelium.

(b) Cysts. They are lined with flat or ciliated epithelium.

3. Aberrant or supernumerary thyroids. In the downward migration of the thyroid gland through the thyroglossal duct from the base of the tongue to its final location, some thyroid cells may become dislodged and remain along the duct (8). Occasionally the entire thyroid gland may remain sublingual and its removal be followed by myxœdema (Murphy, 2). These embryonal rudiments may be multiple, giving rise later in life to multiple goiters (Yakubowski, 25). In general, it may be stated that aberrant or supernumerary thyroids are subject to the same pathologic changes which may occur in the parent gland.

4. Hemangioma (cavernosum). These are always in the nature of fissural angiomas. At first they may appear as simple telangiectases; when fully developed, they present numerous large vascular spaces or sinuses, lined with endothelium, resembling the structure found normally in the penile corpora cavernosa.

5. Lymphangioma. Their structure is in most respects analogous to that of the hemangioma, save that the vascular spaces contained therein are lymph channels instead of blood-vessels. The supporting stroma in which the vessels are embedded may be fibrous, fatty, or mucinous. In the cavernous variety the lymph channels are very numerous and much dilated, so that the structure, on section, has a somewhat spongy texture. The supporting stroma is scanty, thin, delicate, and transparent. Cysts, varying in size from that of a pea to that of a walnut or larger, may be produced. As in the case of hemangiomas, lymphangiomas of the neck occupy, or originate at, the site of the branchial clefts.

6. Hygroma. These are usually large, multilobulated, containing as many as one hundred pockets in a single tumor. The cyst walls are thin and consist of endothelial cells supported by a loose connective-tissue stroma. They are pecu-

liar in having an independent power of growth sufficient to force them into the surrounding tissues (Dowd, 10). Some of them extend from the lower jaw to the clavicle and from the median line almost to the spinous processes of the cervical vertebræ. They have a tendency to penetrate muscles (pseudomalignant); many of them even pass under the clavicle and form an axillary cyst, or under the manubrium to the anterior mediastinum (Kirmisson, 14).

7. Dermoid cysts. The majority of cases of dermoid cysts reported were due to imperfect closure of the second branchial cleft. As a rule they are lined with stratified squamous epithelium, without other skin structures (epidermoid cysts); occasionally the cyst wall will also contain hairs, glands, and fat (dermoid cysts).

8. Carotid body tumor. From a histologic point of view, these tumors resemble endotheliomata or peritheliomata of the suprarenals (Lilienthal, 11). Their normal size varies from that of a grain of rice to a grain of corn. They reach a certain size when from 20 to 30 years old, remain stationary for a time and then the connective tissue only increases. The interlobular blood-vessels thicken, with resulting sclerosis and atrophy.

The consistence varies, but the tumor is usually moderately hard and elastic. In color it varies from a reddish gray to a reddish brown. When present, the carotid body is found most commonly a little posteriorly to the bifurcation of the common carotid artery, lying between the internal and external carotids, and more closely united to one or the other of them. It is attached to the one on which it lies by the "ligament of Mayer," through which it receives its blood supply. The nerve supply is abundant and is connected with both the cranial and sympathetic nerves. It receives branches from the vagus and glossopharyngeal, superior laryngeal, and superior cervical sympathetic ganglion.

Fibers pass from the vagus, glossopharyngeal, and sympathetic, to form a plexus in the angle of bifurcation just in front of the carotid body. Many fibers from this plexus penetrate the capsule of the organ.

These tumors may remain quiescent for many years. Lilienthal's case (11) was that of a woman 60 years of age who had noticed the tumor for 35 years. When malignant changes occur, the growth of the tumor and infiltration of the carotid sheath and surrounding tissues may be very rapid. Funk (8) reports a tumor 8x5 cm., with pressure upon or involvement of the superior cervical sympathetic ganglion, causing contraction of the pupil on the affected side.

#### SYMPTOMS

Subjectively, there are absolutely no symptoms in the vast majority of these cases. If old enough, patients suffer from a varying degree of mental distress caused by the visible presence of a disfiguring tumor or fistula; they may complain of a sense of tightness in the neck, increased by excitement or overexertion; in the case of multilocular hygromata they have reported a gurgling sound on coughing (due to compression of one cyst by the sternomastoid, forcing the fluid content into a neighboring cyst). Fistulæ or cysts may, however, become inflamed or infected, giving rise to the common subjective findings of acute or subacute inflammation.

In a case recently operated upon by the reviewer, the patient, a woman 72 years old, with an incomplete internal branchial fistula (see Fig. 1), had all her lifetime been obliged, after each meal, to evacuate the contents of her cystic fistula into the pharynx, semisolids and liquids being forced into the sac during each act of deglutition. Notwithstanding this repeated traumatism, it was only within recent months that the fistula had become infected, occluding its lumen with subsequent putrefaction of the contents of the cyst. The inflammatory symptoms alone, brought her to the operating table. Of special interest are the subjective symptoms of imperfect closure of the upper portion of the thyroglossal duct, forming what might be termed an exaggerated foramen cæcum. Dr. T. W. Lewis of Chicago has reported (but not published) several such cases. The patients suffered from spasmodic cough and irritation of the pharynx which was relieved only by cauterization of the foramen, usually to the depth of one-half to three-quarters of an inch. In every case reported by Doctor Lewis, touching the opening of the foramen cæcum with the tip of a probe invariably produced an attack of severe spasmodic coughing.

Even carotid body tumors give rise to few subjective symptoms until they begin to infiltrate the carotid sheath, producing pressure symptoms on the vagus, superior laryngeal, and superior cervical plexus of nerves (disturbances of phonation, dysphagia, dry cough, deafness, conjunctivitis).

Objective: (a) Fistula. If of the second branchial cleft, the external opening lies in the skin of the neck, between the anterior border of the sternomastoid muscle and the median line anteriorly, and between the greater cornu of the hyoid bone and the sternoclavicular joint of the same side. The external opening is usually very



small, often so small as only to admit a filiform guide or a bristle. The inner opening lies in the neighborhood of the tonsil, in the lateral wall of the pharynx, or near the pillars of the fauces. In the complete fistula it is sometimes possible to inject fluid through the external opening into the pharynx; the passage of the fluid into the pharynx may be recognized by the patient by its taste or by the surgeon by its color (strychnine, quinine, milk, or methylene-blue solution) (60).

The discharge from a complete fistula is a thin clear mucus; that of an incomplete external is thicker and more turbid; while the incomplete internal variety discharges a thick mixture of mucus and epithelial or endothelial elements admixed with particles of more or less decomposed food.

A fistula of the thyroglossal duct is always median, between the lower margin of the hyoid bone and the sternal notch. Branchiogenic cysts are single, soft, freely movable, not tender (unless recently inflamed), and are never in the median line. Thyroglossal cysts are usually smaller and always in the median line. Collison and MacKenty (9), describe the objective findings of a carotid body tumor as follows:

1. Early. A tumor varying in size from a kernel of corn to a robin's egg, situated under the sternomastoid or at its anterior margin. It is egg-shaped, single, discrete, firm, elastic, moves easily laterally but not vertically, is pulsating (but not expansile), and may give a bruit on auscultation.

2. Late. Paralysis of vocal cords (due to involvement of recurrent laryngeal nerve while its fibers are still within the vagus), difficult phonation and deglutition, congested larynx, irregular pupils with no reaction to light on the affected side, lessened mobility of tumor, loss of weight and progressive cachexia (9).

F. S. Mathews (29) reports a case in a man 27 years old, of presenting hemiatrophy and paralysis of the tongue, in addition to other classical findings. The left side of the pharynx was pushed inward and the left tonsil occupied a position near the median line.

#### DIFFERENTIAL DIAGNOSIS

O. C. Smith (6) has worked out a very exhaustive outline of tumors of the neck which the reviewer appends in full.

##### 1. Inflammatory:

###### (a) Acute:

Parotitis, submaxillary adenitis  
Cervical lymphadenitis  
Furunculosis  
Carbuncle  
Anthrax, actinomycosis  
Ecchinococcus

###### (b) Chronic:

Chronic lymphadenitis  
Tubercular or syphilitic adenitis  
Hodgkin's disease  
Mickulicz' disease

##### 2. Embryologic malformations:

Branchial cysts  
Thyroglossal cysts

##### 3. Neoplastic:

###### (a) Benign:

Lipoma, fibroma, chondroma,  
osteoma, sebaceous cyst (wen.),  
angioma,  
(1) Hemangioma  
(2) Lymphangioma (hydrocele)  
Hygroma  
Teratoma  
(1) Dermoid cysts  
(2) Mixed tumors of salivary glands

###### (b) Malignant:

Carcinoma (epithelioma)  
Sarcoma  
Lymphosarcoma

##### 4. Tumors of special organs:

###### (a) Thyroid:

(1) Physiologic hypertrophy of puberty,  
menstruation, and pregnancy  
(2) Colloid adenoma (goiter) with or without cysts  
(3) Parenchymatous hyperplasia  
(4) Foetal adenoma  
(5) Malignant disease,  
a. Carcinoma  
b. Sarcoma

###### (b) Carotid body tumor

###### (c) Aneurism of aorta and carotids

###### (d) Tumors of larynx

The true nature of a fistula of the neck can be ascertained readily by inquiring into the history of the case. Only branchial or thyroglossal fistulae are congenital. Tubercular adenitis, late carcinomata, or sarcomata and lymphangiomata, or hygromata (the last two only as the result of exploratory puncture or traumatism) may give rise to fistulae. Cysts of the neck must be differentiated from the following: (1) cervical lymphadenitis, (2) carcinoma, (3) sarcoma, (4) fibroma, (5) lipoma, (6) Hodgkin's disease, (7) syphilis, (8) aneurisms, (9) aberrant or supernumerary thyroid, (10) carotid body tumor.

#### TREATMENT

The correct treatment of congenital deformities of the neck is to leave the benign cases alone unless their removal is desired for cosmetic reasons or on account of inflammatory pressure symptoms, and to remove early and radically, growths having a malignant or pseudomalignant tendency such as lymphangiomata, hygromata, and carotid body tumors. It should become axiomatic, for instance, that a solid tumor of long standing, situated in the anterior triangle of the neck, at or near the level of the lower border of

## DIFFERENTIAL DIAGNOSIS OF CONGENITAL

Tumor	Age	Location	Single or Multiple	Density	Superficial or deep	Motility	Fluctuation
Branchiogenic cyst	Congenital	Anterior triangle of neck	Single	Soft	Superficial; may extend deeply	Movable unless infection has occurred	Present.
Thyroglossal cysts	Congenital	Median line below hyoid	Single	Soft	Subcutaneous	Freely movable	Usually present.
Lymphadenitis	Youth	Anterior or posterior triangle	Multiple as a rule, often matted together	Hard at first, later softer	Both as a rule	Slight or absent	Absent early.
Carcinoma	Aged	Depends on site of primary focus	Multiple nodes	Stony-hard, except in late cases with sinus formation	Deep	None	o
Sarcoma	Youth or early middle life	Angle of jaw, sternomastoid	Multiple nodes	Softer than carcinoma	More superficial than carcinoma	Early motility	o
Fibroma	30-45	Very rare in this location	Usually single	Hard	More superficial	Freely movable	o
Lipoma	Any age	No anatomic boundaries; not uniform	Single or multiple	Doughy or "woolly" soft	Superficial	Movable in all directions	o
Hodgkin's disease	10-40	Bilateral as a rule	Multiple, in chains or discrete	Softer than malignant tumors, harder than tubercular glands	Feel like lipomata but are more deeply seated	Movable	o
Syphilis	Any age	Submental or submaxillary glands. Look for chancre	Single or multiple	Hard, painless, adherent	Both	Early lost	o
Hygroma	Congenital	Inferior maxilla to clavicle; may pass to axilla or anterior mediastinum	Multiple; there may be as many as 100 pockets	Soft	More superficial than carotid body tumors	None	May fluctuate impulse on coughing.
Aneurism	Middle age especially	Carotids especially	Single, usually fusiform	Soft	Deep as a rule	Usually none	None
Carotid body tumor	20 to 50 in 75 per cent of cases	Under sternomastoid or at its anterior border	Single, egg-shaped discrete	Firm but elastic	Deep	Lateral motility but no vertical motility	None.

the thyroid cartilage, should be looked upon as a possible carotid-body tumor and removed before it involves the surrounding structures—particularly the carotid sheath. The general modus operandi is essentially that of the radical removal of tubercular glands of the neck. Bearing in mind the probable embryologic derivation of the fistula or tumor, one should resort to a careful dissection of the growth while constantly bearing in mind the tissues and structures which are to be avoided. In the extirpation of hemangiomas, the reviewer has made use of coagulene Kocher-Fonio, in order to minimize hæmorrhage (61). A 5 to 10 per cent solution is injected around the base of the angioma just prior to its excision. Extirpation is much facilitated thereby. The radical extirpation of a complete branchiogenic fistula requires painstaking care. A small probe or ureteral catheter (Dowd, 51) may be

passed through the external opening as far up as possible. A circular incision is then made around its external margin so as to leave a disk of skin around the stoma of the fistula. This is followed by the usual oblique incision parallel to the anterior border of the sternomastoid, including skin, superficial fascia, and platysma. The sternomastoid is retracted outwardly and the dissection will proceed easily as far as the bifurcation of the carotids. From this point on, no sharp or pointed instruments should be used. The final dissection—up to the pharyngeal wall—becomes a slow process of "teasing out" the fistula from the surrounding tissues. With the patient's mouth held open, and using a head mirror, tugging on the fistulous tract will cause a dimpling in, below the tonsil or on the lateral pharyngeal wall. Having freed the entire tract, one of three procedures may be employed to



## MALFORMATIONS OF THE NECK

Gurgling	Pulsation	Bruit	Specific reaction	Fistula	Course	History	Cachexia	Aspiration
None	None	None	○	May be present; may open in mouth or externally	Slow	Congenital	○	Clear or turbid fluid.
○	■	■	○	Rarely present	Slow	Congenital	○	Clear, thin light fluid.
None	○	○	Tuberculin	Late broken down sinus	Sub-acute	Tuberculous	○	Pus in late cases.
○	○	○	○	Only in terminal stage	Rapidly progressive	Primary focus	Present	○
○	■	■	○	Only in terminal stage	Progressive	○	Late	○
○	○	○	○	○	Chronic	○	○	○
○	○	■	○	○	Chronic	○	○	○
○	○	○	Blood picture, splenomegaly	○	Progressive	Irregularly progressive	Late	○
○	■	○	Wassermann positive	○	○	Chancre, etc.	○	○
○	○	○	○	Only after trauma or aspiration	Fairly rapid; extends between fascial layers esp.	May begin as a single cyst, but spreads rapidly	○	Clear, thin fluid.
Present	Expansile, delayed temporal artery pulse on affected side	Present	Wassermann positive	○	Fairly rapid	Syphilis	○	Fatal.
○	Present but not expansile	Present	○	○	Long history of slow growth	Rather sudden change to malignancy	Only very late	○

complete the operation. Von Hacker (54) cuts off the fistula three-quarters of an inch from the pharyngeal wall. An eye probe or small catheter is then pushed through the fistula into the pharynx and sutured to the distal end of the tract. By traction through the pharynx, complete inversion is obtained. The stump usually separates or tears away readily from the mucosa. The opening thus left is sutured with catgut. Wishing to preserve the entire cyst and tract in one of his cases, the reviewer proceeded as follows: Having dissected the tumor up to the pharyngeal wall, two clamps were placed on either side of the tract, in such a manner as not to occlude its lumen. A third clamp was then placed squarely across the neck of the tumor, just distal to the guy clamps, and the mass removed *in toto*. The remaining fistula was then cauterized with pure carbolic acid and a catgut ligature thrown

around the guy clamps, proximal to them, and tied. The clamps were then removed and the incision closed without drainage. The result was perfect. For those cases where adhesions to the carotid sheath make complete dissection impossible or extremely dangerous, Koenig (53) has devised an ingenious method of treatment. He frees the distal end of the fistulous tract as far as he can, and then passes this free (distal) end through the mucous membrane in front of the tonsil and stitches it there, thus leaving a curved sinus with an internal opening at each end—the posterior one pharyngeal, the anterior one buccal.

Thyroglossal fistulæ or cysts should always be injected with methylene-blue and every particle of stained tissue removed. The usual procedure has consisted in shelling out the cyst as far as the hyoid bone. Inasmuch as the tract invariably passes either through or behind this

bone, cures have only been effected in those cases where the duct is represented by a fibrous cord proximal to the hyoid. Recurrences have been the rule. McKenty (13) mentions one case where three successive operations were necessary; even then he does not state whether the third operation was a permanent success. Chiseling or drilling through the hyoid bone, followed by cauterization, is recommended in obstinate cases.

The extreme thinness of the walls of a hygroma makes a clean dissection of the entire tumor almost a surgical impossibility. Portions will tear and remain behind, leading to extremely rapid recurrences. Dowd (10) operated on a girl, not quite three years old, removing the cyst as far as the sternum. It promptly recurred, and at the second operation he was obliged to extend his dissection as far back as the scaleni muscles. This case died on the tenth day from shock and hæmorrhage. A preliminary injection with methylene-blue is absolutely indicated in these cases.

The operative mortality of carotid-body tumors is formidable. Collison and Mackenty (9) collected 60 cases up to the year 1913. Of these, 54 were operated upon. In 4 cases, the operation was merely exploratory in nature; in 32, the common external and internal carotids were ligated; in 7 only the external carotid was ligated; in 15 cases the tumor was dissected away from the blood-vessels or dissected away from the internal carotid or the common carotid after ligation of the external. Recurrences occurred in 6 of these 15 cases; whereas only 2 recurred after complete removal of all the carotids. Immediate death occurred in 12 cases; of the 42 who convalesced, 4 had prompt recurrences, and in 6 other cases speedy deaths were in prospect from recurrences known to have existed when the cases were reported. We thus have an operative mortality of 25 per cent and a prospective mortality of 40 per cent, a far from encouraging outlook. Desgouttes (1) reports the successful removal of a tumor *en bloc* with the internal jugular vein and the pneumogastric, the internal carotid being saved. He has also successfully removed the pneumogastric, the sympathetic plexus, the internal jugular, and the internal carotid in another patient. He does not state, however, whether or not either of his patients succumbed to recurrences. Lilienthal (2) ligated and resected, above or below the tumor mass, the internal jugular and all three carotids, saving the pneumogastric. Twenty-four hours after the operation, his patient developed central

aphasia and right hemiplegia. There was no aphonia, but the left eyeball softened and its pupil contracted. All symptoms except the contracted pupil disappeared in a few days. He ascribes the pupillary contraction as probably due to injury of the superior sympathetic cervical ganglion. It is therefore self-evident that a large percentage of these tumors will be considered inoperable by conservative surgeons. If seen early, dissection away from the carotid bifurcation, leaving the vessels *in situ*, has been suggested (9); in all other cases, if operation is undertaken, the mass should not be dissected away from the blood-vessels but the carotids and internal jugular vein should be removed *en masse*, after freeing the pneumogastric.

#### SUMMARY

1. The pre-operative diagnosis of congenital deformities of the neck is all too seldom made. A careful history and examination of the deformity, oftentimes aided by the injection of either bitter tasting or coloring substances, will enable the surgeon to make a correct pre-operative diagnosis.

2. No operation should be undertaken unless the surgeon is prepared to carry the same to a complete conclusion. Partial removal of a secreting wall is worse than leaving it *in situ*.

3. The desirability of operating on carotid-body tumors must depend on: (1) a very early diagnosis, while the tumor is still benign; (2) in late cases, on the desperate nature of the patient's symptoms (paralysis of vocal-cords, stenosis of pharynx, hemiplegia, hemiatrophy, paralysis of tongue, etc.).

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

#### OPERATIVE SURGERY AND TECHNIQUE

**Grant, W. W.: The Immediate and After-Treatment of Railway Injuries.** *South. M. J.*, 1916, ix, 357.

The circumstances, conditions, and environment of railway injuries are unfavorable to the best treatment so that tentative measures only should be used until the patient is in more favorable surroundings. The immediate application of hydrogen peroxide and iodine with dry sterile gauze is recommended for wounds. Fractures should be temporarily immobilized.

Hæmorrhage is a common condition in railway injuries and many times is incorrectly treated. Pressure to stop the hæmorrhage should be used for as short a time as possible, as tissue necrosis and subsequent sloughing may result from prolonged anæmia of the parts.

Shock is frequently unscientifically treated and its presence many times disregarded. No serious operation should be performed in the presence of shock. To combat shock dry heat applied to the body, hypodermoclysis, rectal saline, and sugar solutions are recognized agents.

Fractures should be treated if possible without the open method; especially should all compound fractures be left alone as regards surgical approximation of the fragments, for at least ten days or two weeks following the accident.

Conservative surgery as regards feet and hands is very important. Ragged wounds should be left open to allow free drainage. Muscles, tendons, and nerves should be carefully sutured. Skull fractures should be carefully explored and all fragments and bone débris should be removed.

J. H. SKILES.

**Barclay, A. E.: Preliminary Note on a New Method of Bullet Extraction.** *Arch. Radiol. & Electrotherap.*, 1916, xx, 359.

Barclay's method is an elaboration of the scheme of marking the location of a foreign body by inserting a large needle into the tissues until the body is reached, using the fluoroscope to guide the needle. Instead of inserting a needle he uses two prongs, one longer than the other, the point of the shorter prong fitting into the depression near the point of the longer one to make the insertion easier. The outer ends

of the prongs have handles arranged at right angles to avoid the screen and made like scissors so they can be opened and closed. He has also arranged his instrument electrically so that a bell rings when a metallic body is in contact with the prongs. Fourteen cases are reported in which the foreign bodies were removed with a small skin incision and without the mutilation of tissue usually required in such cases.

J. G. BURK.

**Cathcart, C. W.: Methods of Preparing Sphagnum Moss as a Surgical Dressing.** *Lancet*, Lond., 1916, cxc, 820.

A description is given of a simple and economical method of sterilizing sphagnum moss. The absorbing qualities of the moss are superior to cotton wool. The moss is first picked clean of grass and leaves and suitable quantities are placed in small flannelette bags, which are immersed in bichloride solution so that the moss is impregnated with one-fourth of one per cent of bichloride of mercury. The bags are then hung up to dry in a room heated with a slow combustion stove. They are then compressed by an ordinary clothes wringer and are ready for packing. Care must be taken in shipping that the moss is not exposed to moisture, otherwise it will swell and burst the packing boxes.

H. G. SLOAN.

**Tovey, D. W.: The Nerve Supply of the Lower Abdominal Wall as Related to the Pfannenstiel Incision.** *Am. J. Surg.*, 1916, xxx, 145.

Special care should be taken in any abdominal incision not to injure the nerves supplying or crossing the cut structures, since such nerve injury predisposes to hernia by causing paralysis of muscle or atrophy from disturbed nutrition or loss of sensation.

The course and distribution of the nerves of the lower abdominal wall are described, especially those which may come in the field of a Pfannenstiel incision, principally the anterior divisions of the twelfth dorsal and the hypogastric branch of the first lumbar.

In the Pfannenstiel incision, after the aponeurosis has been separated from the muscle and the linea alba divided and the upper flap retracted, two or sometimes four large nerves can be seen coming up from the recti about an inch from the median line



and piercing the anterior fascia. These are the anterior divisions of the twelfth dorsal nerve. They are often half as thick as a match, double, and accompanied by a blood-vessel. They should not be cut, as in retracting the upper flap they can be drawn out sufficiently in nearly all cases. The cutting of these nerves, according to Tovey, may account for the reported cases of hernia following the Pfannenstiel incision.

LUCIAN H. LANDRY.

**MacLennan, A.: The Prevention and Treatment of Some Obscure Conditions Complicating Convalescence After Gastro-Enterostomy.** *Glasgow M. J.*, 1916, lxxv, 313.

MacLennan considers the undesirable sequences of gastro-enterostomy, and describes an operation by the adoption of which these sequelæ may usually be prevented. The steps are as follows:

1. Except in infants, the new stoma is made on the pyloric side of the lowest point of the great curvature.

2. The colon is raised so as to display the mesocolon; that area which is freest of vessels, yet contiguous to the selected spot on the stomach wall, is divided vertically to the necessary extent.

3. The stomach is drawn through the slit in the mesocolon and clamped perpendicularly, occasionally with a slight inclination toward the pylorus, but never with the inclination toward the left. The omentum and colon are then returned into the abdomen.

4. The bowel to be attached is emptied by digital pressure and clamped when flat.

5. One continuous Lembert suture (silk) unites the two surfaces along the line which is sickle-shaped at the lower end and which is just off the free edge of the bowel. At the end of the line the thread is hitched under the last loop and caught lightly in a pair of pressure forceps, so applied that the serrations of the forceps cannot cut the silk.

6. The stomach is opened and a small circular section is removed from the entire thickness of the wall corresponding to the curvature in the line of the Lembert suture, making a racquet-shaped opening. The same is done to the bowel; but on no consideration is the mucous membrane of the latter excised in the slit part. The redundant mucous membrane at the upper part of the stoma offers some impediment to the entrance of bile, while the cutting out of a section of stomach and bowel leads to the formation of a gaping hole over the mouth of the efferent jejunum and facilitates evacuation of stomach contents.

7. The operation is concluded by suturing the openings together with catgut and then continuing the Lembert suture which has been laid aside. As little of the girth of the bowel is taken up as possible. The junction is placed inside the lesser peritoneal cavity, by uniting jejunum to the opening in the transverse mesocolon, for the greater safety thus gained in localizing possible leakage.

In the author's opinion bleeding from a duodenal

or pyloric ulcer forms the sole indication for closure of the pylorus. Where hæmorrhage has occurred, all large vessels going toward the site of the ulcer are ligated. Closure of the pylorus has no influence in preventing bilious regurgitation.

Following gastro-enterostomy morphia is allowed during the first twenty-four hours only. The Fowler position is used; rectal saline is given every four hours, a dessertspoonful of brandy, and glucose on raisin tea being generally included. During the first twelve hours nothing is swallowed, though the mouth is frequently washed out with ice water. During the second twelve hours, sips of water acidulated with lemon juice are given every quarter hour. During the next twenty-four hours the water is increased to a half ounce, while during the latter part of this time dessertspoonfuls of buttermilk are given. On the third day the diet consists of beaten curds, buttermilk, lemon tea, coffee without milk, and sugarless stewed apples. On the fourth day calomel is administered (about 3 grains) in one-half grain doses, every quarter hour. This is followed by a suds enema containing asafœtida, quinine, or turpentine. Thrice daily, scrambled egg, banana and cream, malted milk, or fish cream in addition to the sour milk, apple, etc., is given. Thereafter the diet is gradually increased until at the beginning of the second week fruits (cooked or uncooked), chop, fowl, and fish are included. A sour wine may be taken advantageously with the meaty meal, but fresh milk after gastro-enterostomy must be avoided. Bilious regurgitation without vomiting in cases with urgent symptoms requires the stomach tube. After siphoning, the stomach should be washed out with warm water, and a few ounces containing a tablespoonful of vinegar left in. Small doses of opium or, better, one-twentieth grain of heroin may be given thrice daily to encourage gastric contraction, and retard the secretion of bile.

The mechanism of bilious regurgitation is well called a vicious circle, for the presence of bile induces conditions which encourage its continuance. In the presence of alkali the stomach relaxes, and the extra weight of the fluid increases the sagging of the organ, whose capacity for holding bile is further enhanced. As the overfilled organ sags, it inclines to close its exit by obliterating the lumen of the jejunum. The position assumed by the patient then becomes of importance in so far as it may relieve a downward pressure. Under these conditions, also, vibratory massage is efficient. Heat is comforting, and assists in the return of gastric tonicity. In the acute states of regurgitation, champagne, 2 to 4 ounces, will speedily produce amelioration. A peppermint liqueur is excellent for occasional bilious regurgitation.

ALBERT EHRENFRIED.

**Weeks, A.: A Simple Method of Giving Solutions by Bowel.** *J. Am. M. Ass.*, 1916, lxi, 1022.

After numerous experiences in watching the routine use of the Murphy drip after operations in various hospitals, the author came to the conclusion

that half of the distress complained of by patients is due to the retention in the bowel of gas or too much fluid. This is especially so in little children.

For some time he has used a method which consists of the usual container and dripper supplied by all hospitals with a small glass funnel; a funnel-holder which will fit on the container stand; 5 feet of rubber tubing, with a glass tip, and an ordinary rubber catheter to suit the case. The funnel hangs on a level with the patient's abdomen. The container is hung so that the dripper will drip into the funnel. The solution is allowed to drip only as fast as it is absorbed, and it is not necessary to keep it warm.

EDWARD L. CORNELL.

### ASEPTIC AND ANTISEPTIC SURGERY

**Emery, W. D.: A Standard Method of Testing Antiseptics for Wounds, with Some Results.** *Lancet*, Lond., 1916, cxc, 817.

The author has aimed to test antiseptics under the same conditions as when they are ordinarily applied to wounds. He uses blood as a medium because of the presence of blood in all fresh wounds, and further because pus, which would be the ideal medium, is difficult to obtain of a uniform type. Washed corpuscles were added to an equal amount of serum so that there would be no clotting while the experiments were being carried on.

He used the streptococcus faecalis in testing the potency of the various antiseptics because it is the chief enemy in wounds; it can always be obtained in pure culture; it grows rapidly, so that the results can be secured in twenty-four hours; and furthermore it readily emulsifies so that there are no masses to resist the action of the antiseptic. In the author's technique he uses nine parts of blood and one part of 18-hour culture of the streptococcus, containing about 250,000,000 cocci per ccm. This solution was thoroughly mixed with an equal quantity of the antiseptic to be tested on a glass slide. Equal portions of this mixture were then sucked into two capillary pipettes and the ends sealed. Pipettes were then incubated, one for fifteen minutes and the other for one hour, and at the end of this time two loops from each pipette were inoculated on the surface of an agar plate. These plates were then incubated and the number of colonies determined after twenty-four hours.

Some antiseptics show fewer colonies after fifteen minutes than at the end of an hour, because of their faculty for combining with the protein in the medium in which the bacteria are mixed. This neutralization of the antiseptic with the protein has very nearly passed off at the end of an hour so that the remaining bacteria flourish more at this later period.

Emery found that by this method, Dakin's solution was only one-seventieth as powerful as carbolic acid. It was one-fortieth as powerful as biniodide solution, one-thirtieth as strong as lysol, and one-two-hundredth as strong as malachite green. Un-

fortunately, the action of this last antiseptic on the living cells is too powerful for clinical use.

The end-result of any antiseptic, in wounds, is a combination of its action on the infecting bacteria, coupled with its action on the fixed body tissue cells. This latter factor, the author has been unable so far to determine accurately, but he is working on this problem.

HARRY G. SLOAN.

### ANÆSTHETICS

**Stanley, L. L.: Spinal Anæsthesia; Analysis of Two Hundred and Eighty Cases.** *J. Am. M. Ass.*, 1916, lxxi, 1090.

In the 280 cases in which spinal anæsthesia has been used on the inmates at the San Quentin, Cal., prison, tropacocaine in 1.5 gr. doses has been the agent employed.

In ordinary operations, excepting those in which the abdominal viscera are handled, no hypnotic is given the patient before the operation. The patient walks to the operating room and mounts the table. Within one minute he feels that his feet are becoming warm, and he may even feel a tingling sensation in his toes. Within two minutes, sensation is lost about the anus and, as a rule, within about four minutes the loss of sensation is so great that operations for hernia may be done without pain. For operations above the umbilicus, the patient is allowed to stay in the Trendelenburg position for six or seven minutes, for apparently it takes that long for the tropacocaine to gravitate cephalad to bathe the nerves which supply these segments. For operations about the anus, the average Trendelenburg position has been 1.7 minutes; for operations on varicose veins 2.5 minutes; for operations on the scrotum 2.4 minutes; for hernia 3.1 minutes; and for gastro-enterostomy 4.2 minutes.

The conclusions are as follows:

1. In this series of 280 cases there has been no fatality.
2. There has been comparatively little shock.
3. There has been headache in only 8 per cent of cases.
4. There has been no pneumonia following the operation.
5. There have been very few post-operative complications.
6. There have been no permanent paralyses following the anæsthetic.
7. The period of convalescence has been shortened.
8. With the relaxed muscles, closing of the abdomen is greatly facilitated.
9. The blood-pressure has fallen in most cases, but in the average case not to a dangerous degree.
10. The height to which the anæsthetic is effective is influenced by the length of time the patient is in the Trendelenburg position.
11. The pulse-rate is not influenced to any marked degree by tropacocaine intraspinally administered.

EDWARD L. CORNELL.



**Mahn, G.: Practical Notes on Local Anæsthesia in Otorhinology** (Notes oratiques sur l'anesthésie locale en oto-rhinologie). *Ann. d. mal. de l'oreille et du larynx*, Par., 1916, xl, 845.

In most interventions in the frontal and maxillary sinuses or in the mastoid not alone must the superficial layers be anæsthetized but also and especially the bony walls, internally as well as externally, trepanation of these cavities being usually followed by curettage. In order to obtain this result the author says that it is necessary and sufficient that the injection should be pushed into the exterior periostic layer. But the anæsthesia will be more perfect if a large part of the periostic surface enveloping the cavity is injected.

The author uses a novocaine solution, and three hours prior to its use he makes a hypodermic injection of pantopon or morphine. His technique is given in detail.

W. A. BRENNAN.

**Kroenig, B., and Siegel, P. W.: Shockless Surgery with the Help of Paravertebral Anæsthesia and Scopolamine and Narcophin.** *Surg., Gynec. & Obst.*, 1916, xxii, 524.

Kroenig reports 670 cases of gynecological and obstetrical operations done under paravertebral anæsthesia at the University Frauenklinik in Freiburg, Germany.

The method consists in blocking the nerve-trunks directly at their exits from the intervertebral foramina, or from the sacral foramina for the sacral nerves, with a one-half per cent solution of novocaine suprarenin, tablets "A," prepared by Hoechst Farbwerke. The anæsthesia is preceded by two-thirds to one gram of veronal on the night before the operation, and 0.0003 gr. scopolamine and 0.03 gr. narcophin two and one-fourth and one and one-half hours respectively before beginning the anæsthesia, and half a dose of each one-half hour before anæsthetization if the twilight sleep is too light. For cachectic patients or patients weighing under one hundred pounds the dose is reduced to 0.000225 gr. scopolamine and 0.0225 gr. narcophin respectively, and 0.00075 gr. scopolamine and 0.075 gr. narcophin for the last dose if necessary. The anæsthesia continues uniform from two and one-half to three hours, and operation may be begun from fifteen to twenty minutes after anæsthetization.

The complications noted are of minor importance and may result from the condition of the patient or from the operation itself. No deaths resulting from the anæsthesia were noted. An attempt was also made to eliminate post-operative pain by dusting a powder, called "anæsthesin," into the wound as it was closed by layers. Apparently a reduction of pain was accomplished in most cases and in some there was a complete elimination of post-operative pain, but the resulting œdema in the wound and retardation of healing seem to be factors that more than outweigh the slight advantage gained, and the use of this powder has been discarded for the present.

Preceding the anæsthesia with scopolamine and

narcophin eliminates the psychic shock due to the preliminaries of an operation, and patients often have no recollection of events from the time they receive their veronal on the night before operation until they recover full consciousness three to six hours after the operation.

The variety of operations done under this form of anæsthesia indicates its general applicability in general surgery as well as in gynecology and obstetrics, and the success of the Freiburg clinic warrants a fair trial by the profession. The technique is not as difficult as it might seem and requires only a definite knowledge of the distribution of the sensory nerves, or working according to tables compiled by experienced users of the method.

With the elimination of the post-operative pain, upon which problem the Freiburg clinic is still working, the method presents the ideal form of anæsthesia. Its chief advantages lie in the uniformity of the anæsthesia obtained, and in the lack of serious immediate or post-anæsthetic complications.

#### SURGICAL INSTRUMENTS AND APPARATUS

**Thompson, G. S.: Some Surgical Uses of Celluloid.** *Brit. J. Surg.*, 1916, iii, 696.

Celluloid used for surgical purposes varies in thickness from that of ordinary photographic films to that of thick cardboard. In cases where it is desirable that it become encapsulated it should be perforated with punch holes throughout. When infection does not occur the celluloid does not provoke irritation of the tissue sufficient to cause subsequent sinus formation or the extrusion of the celluloid. The celluloid is sterilized in the autoclave or by boiling. If crinkling is to be avoided the material must not be boiled for a long period. It is not an absorbable material.

Thompson suggests that celluloid might be used to advantage in the various types of herniæ. The precautions necessary to be observed in its use are pointed out by the author. In femoral herniæ the plate should be triangular in shape and should be provided with a flange on its outer border where it comes into relationship with the femoral vein. The plate for inguinal herniæ should be roughly elliptical and should have a gap for the passage of the cord at its lower border. In the skull thick plates are used, fashioned to suit the aperture. Perforations are avoided. Celluloid will be found preferable to other material, such as transplanted bones—phalanges, pieces of rib, etc., in plastic operations on the nose for restoring the bridge. Thompson suggests the possibility of using celluloid caps for the ends of bones after certain operations. For this purpose he suggests that there be kept on hand a series of casts and molders in different sizes corresponding to the commoner joints involved. The celluloid is softened and applied to the cast, and it is then worked into shape with the molder. The whole is then placed in cold water to harden.

It is suggested that celluloid be used for medullary pegs after fracture. The advantages claimed for the medullary peg of celluloid are: it is not brittle; it gives perfect alignment; does not interfere with osteogenesis, and therefore does not favor non-union; causes only slight disturbance to parts; causes no discomfort to the patient; it requires only a minimum of trauma for its introduction; the operation is rapid. In the author's opinion the alleged defects of pegs do not exist, and granted a correct technique, gratifying results may be anticipated. He believes that this method is destined to supersede the others.

Spina bifida is a condition in which ideal closure of the gap can be made by a properly shaped celluloid plate. A flame-proof celluloid known as "taxuloid" is now on the market.  
ISIDORE COHN.

**Johnson, C. C.: Fracture Splints.** *Lancet-Clin.*, 1916, xvii, 373.

The author uses tin as material for splints, and believes it most practical, especially for the country practitioner. The tin splint is most advantageous because it is light in weight, is firm and strong, is capable of being molded, and can be sterilized.

J. R. MARTIN.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Von Hacker: The Plastics of Penetrating Cheek Defects Due to Gunshot Injuries** (Plastic bei penetrierenden Wangen Defekt und nachfolgender narbiger Kieferklemme insbesondere nach Schussverletzungen). *Beitr. z. klin. Chir.*, 1916, xcvi, 289.

Von Hacker's method of remedying defects of the cheek due to gunshot wounds is divided into two stages.

In the first stage an Israel flap is cut from the cheek down the neck commencing close to the defect but in such a way that a strip of skin is left between the defect and the flap. This strip is termed the bridge. The flap, which hangs from the cheek, is turned over, passed under the bridge, and part of it covered over the defect. This is sutured to the edges of the defect, and the former outer skin surface of the flap thus forms the interior lining of the mouth at the defect. The edges of the flap site are approximated.

The second stage of the operation takes place when the flap has healed in the defect. This consists in severing the lower edge of the bridge and with this and the unused portion of the turned over skin-flap patching over the external surface of the defect and approximating edges.

The author illustrates his procedure by several diagrams clearly showing the steps in the operation. He also shows some photographs of the excellent results obtained. He points out that his method by allowing the flap to be nourished during the healing process prevents necrosis and is thus superior to other methods in use.

W. A. BRENNAN.

**Perry, R. St. J.: Pons Nasi.** *Am. J. Clin. Med.*, 1916, xxiii, 309.

The author describes in detail the method of making a plaster cast of the nose in deformities thereof.

An attempt is then made to correct the deformity by one or more procedures. Submucous resection with straightening of the nasal bones may give the result desired. When depressed areas are present, a piece of cartilage from a rib may be inserted to fill out the nasal contour. When unsightly pro-

jections are present these may be curetted off subcutaneously with a special spokeshave. An injection of paraffin must sometimes be resorted to finally.  
J. H. SKILES.

**Vilvandr , G.: Radiography in Gunshot Wounds of the Skull.** *Arch. Radiol. & Electrotherap.*, 1916, xx, 306.

The point which the author wishes to emphasize is that owing to the bad prognosis in lesions in which a foreign body has lodged in the brain, no operation should take place on a skull which has not been previously radiographed to ascertain the presence or absence of a foreign body and its careful localization.

To trephine a skull for a depressed fracture will of course give relief; but a patient with a bullet or piece of shrapnel in his brain will, with perhaps a few remote exceptions, die within six months of cerebral abscess. The only exception which might be allowed is that in which the bullet is not distorted through a previous ricochet and is in all probability aseptic. The first point can be determined by the X-ray.

HOLLIS E. POTTER.

**Lee, J. R.: Removal of Intracranial Foreign Body Under X-Rays.** *Brit. M. J.*, 1916, i, 447.

Attempts to locate a piece of shell in the occipital lobe with a probe or to remove it with an electromagnet having been unsuccessful, the X-ray screen was tried. The operator was clearly able to see a probe which had been passed in along the track and the fragment which had been pulled forward by the magnet and was caught in brain tissue. Removal of the fragment was effected by means of a crocodile forceps passed along the track to a depth of four inches. Noting the relation of the fragment to the instrument during the process of removal may prove of material assistance.

E. K. ARMSTRONG.

**Whitaker, R.: Gunshot Wounds of the Cranium.** *Brit. J. Surg.*, 1916, iii, 708.

The author reviews the results of his observations on 106 cases of cranial injuries which have been re-



ceived for treatment from seven to ten days after the injury. Of this number 88 were penetrating or perforating wounds of the brain.

The operative treatment originally advocated by Sir Victor Horsley was the method of procedure adopted in these cases. It is in the main as follows:

1. The injured and septic area of the scalp must be freely excised.

2. The injured area of skull must be freely exposed by suitable incisions and turning down suitable flaps.

3. Normal dura mater must be freely exposed around the entire circumference of the wound which it penetrates, by a wide removal of bone. Foreign bodies, blood, and pus must be removed from the brain, without breaking down protective adhesions. The whole wound must be left open from the first.

In wounds where the bullet has perforated the brain the wounds of entrance and exit must be treated alike. When the wounds of entrance and exit are close to one another the two openings are joined—a new factor, that of decompression, is appreciated in the treatment of these cases. It soon became apparent that these cases did better than those in which the wounds of entrance and exit were not so close together. Cerebral herniæ in these cases did not become strangulated but ultimately “retired inside the dura mater, which in the end became slightly concave.” Whitaker has made it a practice to remove those foreign bodies and fragments of bone which are obvious, but he has not searched at length for them, as he has found that the brain is far more able to take care of itself in this direction than is ordinarily believed.

The length of time taken for the operation is an important factor in preserving the patient's life. Speed and free decompression have been the dominant ideas in these cases. The type of infection has been an important determining factor. Strep-tococcal infection has been fatal in 90 per cent of cases. It is not usually associated with the formation of adhesions; the hernia grows rapidly and is not covered by a protective membrane. In the cases showing a staphylococcal infection the patient makes an amazing fight; when death occurs it is due to infection of the ventricles through a narrow track. These cases show a marked protective covering for cerebral herniæ.

As to the technique employed, chloroform and oxygen have been given. The local preparation of the scalp consists in washing with petrol, with methylated spirits, and then with iodine. From the beginning of the operation the wound area is continuously irrigated with 1:40 carbolic. Bleeding vessels are ligated, but forceps are left on for twenty-four hours. Bleeding from the dura and sinuses are dealt with by muscle-grafting.

The muscle-graft not only serves to control hæmorrhage but it serves as a center for granulation formation. When the bony parts are removed the irrigating fluid is changed to hydrogen peroxide. All obvious foreign bodies are removed and the

wound dressed; prior to this, however, an unperforated piece of rubber is placed over the dura. The wound is dressed with a 1:20 carbolic or cyanide gauze. Morphine is given as necessary. Urotropine is the only other drug given (10 grains every 6 hours). The first dressing is applied after 6 hours, and the forceps are removed.

Lumbar puncture has been used in only a few cases in this series. The effects of lumbar puncture are very transitory; its performance cannot fail to mean an added strain to a case that has already as much as it can bear.

Under good conditions it is probable that every case of fracture of the skull should be operated upon within the first three days after arrival at the hospital; when cases are received after fourteen days it is probably best not to operate unless there “be definite clinical manifestations of increasing intracranial mischief.” During the intervening period the following conditions demand immediate operation: active septic processes in a badly drained wound; evidence of cerebral irritation or compression; coma and slow pulse.

ISIDORE COHN.

#### Jackson, H.: Craniopharyngeal Duct Tumors.

*J. Am. M. Ass.*, 1916, lvi, 1082.

Jackson reports one case and refers to 37 cases collected from the literature of tumors arising from rests of embryonic tissue along the course of the craniopharyngeal duct.

These rests of buccal epithelium, which may occur within the persistent canal and at the cranial extremity of this canal in the region of the infundibulum and anterior lobe of hypophysis, may give rise to cystic or solid tumors.

These hypophysis duct tumors lie in the median line at the base of the brain, bounded anteriorly by the optic chiasmus, posteriorly by the pons, above by the floor of the third ventricle, and below by the sella. Laterally they may encroach on the cerebral peduncles and temporal lobes. The circle of Willis usually surrounds the tumor. The hypophysis itself may be found intact or be pressed against the floor of the sella. The first five cranial nerves may early undergo a pressure atrophy, but the olfactory nerves usually escape. The foramen of Monro may be occluded, and internal hydrocephalus may result. The optic tracts are most seriously affected and may be spread out on the tumor like a ribbon. The sella is usually normal in size or only slightly enlarged. The tumors are usually the size of a pigeon or hen's egg when discovered. The majority are cystic; when solid they show areas of cystic degeneration. The author describes the histology in detail.

Of 17 cases in which the symptoms are clearly stated 12 were associated with adiposity and other symptoms of the Froelich syndrome, such as genital dystrophy and loss of body hair. In 26 cases, 19 had symptoms of failing vision and 15 of brain pressure. Optic atrophy was noted in 17 cases. The clinical course is varied; some cases reach the acute

stage in three or four weeks, others have symptoms for years.

No case reported has been associated with acromegaly.

In regard to diagnosis, roentgenoscopy is usually negative because the sella is rarely enlarged. The early disturbance of vision and one or more symptoms of the Froelich syndrome, especially adiposity, will suggest a tumor of the hypophyseal region; 70 per cent of these are craniopharyngeal duct tumors. The finding of a cyst at operation with the microscopic demonstration of stratified epithelium of the buccal type completes the diagnosis.

If drainage of the cyst type can be maintained, the patient can live for an indefinite length of time. If the cyst continues to enlarge, blindness usually results from pressure on the optic tracts or chiasm, and death follows in a few months or years from brain pressure. On the whole the outlook for this type of tumor is bad, as it is practically impossible to separate the cyst wall from the surrounding brain structures.

Three operations were performed by Kanavel by the transsphenoidal route, the nose being reflected upward. The anterior wall of the cyst was removed, together with some blood-stained fluid. The patient is still living one and a half years after the last operation, and there has been no return of symptoms to date.

E. H. POOL.

#### **Royce, C. E.: Sarcoma of the Base of the Skull.**

*J. Am. M. Ass.*, 1916, lvi, 1288.

Reported cases of sarcoma of the bones of the base of the skull are not numerous. Of twenty sarcomata in this region, 60 per cent occupied the middle fossa. They rarely progress toward the brain but invade the bones and sometimes send processes into adjoining sinuses. Disturbances of the cranial nerves gradually appear, due to growth about the nerve-roots. Sarcomata tend to involve one side only; if bilateral they are almost always carcinoma or endothelioma; exceptionally bilateral growths may be fibrosarcoma or very malignant sarcoma. The author quotes Cantonnet's case of sarcoma of the sphenoid and reports a case of his own. In the latter there had been complaint of headache and disturbance of vision, ophthalmic examination showing optic neuritis with exudate. Decompression revealed nothing but increased intracranial pressure. At necropsy an encapsulated mass 9 cm. in diameter was found intimately connected with the periosteum covering the sphenoid bone. Section showed cells of a spindle-shaped type, mitotic figures not being numerous, and tumor-cells everywhere separated by a reticulum of connective tissue.

E. K. ARMSTRONG.

#### **Black, D.: Cerebellar Localization in the Light of Recent Research.** *J. Lab. & Clin. Med.*, 1916, i, 467.

The author points out that the general theory of cerebellar localization as originally formulated by

Bolk has been to a large extent confirmed not alone by experimental studies but also by careful clinical observation. Barany's localizations in the human cerebellar cortex remain yet to be confirmed in detail but the importance of his work in thus presenting a possible means of early diagnosis of cerebellar disease cannot be overestimated. Black further points out the contrast in the phenomena of motor localization characteristic of the cerebrum with those of the cerebellum and notes the fundamental differences between cerebral and cerebellar control. The cerebellar cortex has been shown to be practically inexcitable as compared with that of the cerebrum over the motor area.

He points out that muscular representation in the cerebral motor is chiefly determined by the segmental position of the respective muscles and, broadly speaking, more caudad muscles are represented in the upper portion of the motor area while the most cephalic groups are represented in the lowest areas of the precentral region. On the other hand in the cerebellum, while the grouping of the "tonus centers" has been determined in part by segmental position, their arrangement within the lobules has been chiefly determined by the functional association of muscular groups.

The cortex of the cerebellum is everywhere concerned in the elaboration of tonic, sthenic, and static impulses of a reinforcing nature distributed for the most part homolaterally. A special part only of the cerebral cortex is concerned in the elaboration of impulses of a voluntary, motor, clonic nature distributed heterolaterally.

Destruction of the motor cortex on one side of the cerebrum gives rise to an actual paralysis of a spastic nature in the musculature of the opposite side of the body, while destruction of the cortex on one side of the cerebellum causes no paralysis but gives rise to atonia, asthenia, and astasia of the musculature on the same side of the body.

GEORGE E. BEILBY.

#### **Amberg, E.: Conduction Anaesthesia in a Case of Brain Abscess.** *Tr. Am. Otol. Soc.*, Washington, 1916, May.

The patient, 37 years old, had been ill for about ten days with severe pain. He had had a middle-ear suppuration on the left side for sixteen years. Various mental tests with a pencil, watch, keys, etc., showed that he recognized the objects but could not name them, and a diagnosis was made of intracranial complication of a chronic middle-ear suppuration.

The patient was removed to the hospital and a radical mastoid operation was performed and masses of cholesteatomatous material removed. Pus led the way upward and backward, and a small opening of the skull above and behind the external ear canal exposed a fresh pinkish-colored pachymeningitis. The patient was not benefited by the operation, and several days later an extensive opening was made adjacent to the small upper opening, about 1.5 inches backward, and about 0.25 to 1 inch wide, exposing also the lateral sinus. Introduction of the



brain knife through the area of pachymeningitis to a depth of 2 cm. failed to reveal anything of importance. The patient did not improve.

Four days later, the dura, which did not pulsate, was incised vertically about half an inch behind the area of pachymeningitis, and a Jackson brain-searcher introduced forward, upward, and inward, liberating about six drams of pus. There was no pulsation; no colon bacilli were found.

Two days later the brain-searcher was introduced backward, liberating about three drams of pus. There was no brain pulsation and not much improvement.

Several days later the process was repeated, the brain-searcher being introduced deeper and more forward, over one ounce of pus being liberated. The brain pulsated, and the patient's condition was improved.

Three days later more pus was liberated. Pulsation was good. The brain-searcher was directed to a point about 0.5 to 0.75 inch above the eyebrow, in the middle of the forehead and introduced to a depth of about 1.75 to 2 inches. About one ounce of foul smelling pus, with gas, was evacuated. A rubber drainage tube was introduced and there was a constant discharge. Fresh dressings were applied daily, the rubber tube being reintroduced, the length gradually being shortened for about five weeks, when the brain wound had entirely healed.

The patient's perception and recollection seemed to improve throughout the course of treatment. When shown objects such as a nail file, collar button, he could recognize them but was unable to name them readily. He could write better than he could read. He wrote rapidly but was unable to repeat the words he wrote.

XI-29-15. C. C. McClelland reports: Examination of fundus with "H. & C." drops, pupils dilated fully and equally in usual time. Left eye details of fundus easily seen. Nerve head indistinct on nasal side, more clearly defined on temporal side. Right fundus about same as left.

XI-20. Total leucocytes 20,900; polynuclear 88.4 per cent; blood-culture negative.

XI-23 White 14,932; polynuclear 79 per cent

XI-25 Total white 14,100; polynuclear 79 per cent

XI-26 Total white 13,240; polynuclear 75 per cent

XI-27 Total white 10,666; polynuclear 71.6 per cent

XI-29 Total white 11,000; polynuclear 71.1 per cent

XI-7 Total white 12,000; polynuclear 68.5 per cent

XI-23 Cells in spinal fluid 172 per ccm.; no organisms.

When heard from three months later, the patient stated that he felt very well but that he tired out quickly and that he sometimes had headaches and dull pain in his head when he worked too hard.

Cope, V. Z.: *The Pituitary Fossa and the Surgical Methods of Approaching It.* *Lancet*, Lond., 1916, cxc, 601.

A pituitary body is present in all vertebrates, but only in mammals is there a specialized protection afforded by the skeleton. In the human embryo

the fossa is formed at an early stage, a recess being observable in an embryo of 28 mm. The current statement that the craniopharyngeal canal lies between the pre- and post-sphenoid is incorrect. The canal traverses the anterior part of the post-sphenoid. Radiograms of the sellæ of children show that there is normally great variation in size, and that there is no particular age at which special increase in size occurs.

The size of the pituitary fossa varies, but roughly it is 11 mm. long and broad and 6 mm. deep. The sella is lined by dura mater and roofed in by the diaphragma sellæ, so that the gland is hemmed in by a cuboidal box, three sides of which are bone and three sides fibrous. The sphenoidal sinus enlarges somewhere between the seventh and the fourteenth year until the whole of the presphenoidal area is excavated, at which point the excavation may stop, but it commonly proceeds back into the basisphenoid. In the former type the pituitary fossa causes no bulge into the sinus, while in the post-sphenoidal type the bulge is always present.

The fossa is surrounded by a venous and surmounted by an arterial circle, the circle of Willis. The venous circle is formed by the two cavernous and the anterior and posterior intercavernous sinuses. A pituitary growth ascending from the fossa enters the arterial circle, pushing up the optic chiasma until the optic nerves are gradually strangled between the neoplasm and the arteries.

Abnormal fossæ may be classed as enlarged, reduced, and deformed. Enlarged sellæ may be due to adenomatous overgrowth of the anterior part of the gland, to malignant neoplasm originating in the fossa, possibly to repeated physiological enlargement due to increased functional activity, and more rarely to a general or local hydrocephalus, chronic circumscribed meningitis, or to tumors of other parts of the brain. Very small fossæ are seen in cases of hypopituitarism associated with imperfect development of the gland. The fossa may be deformed by tumors bursting from within or by interpeduncular neoplasms pressing down from above. In the former the nature of the deformity would depend upon the rate of growth, producing a thinning, a cup-shaped outline, or banishment of all traces of the original shape. If the dorsum sellæ or anterior or posterior clinoid processes are obliterated or markedly eroded, there must be a large intracranial extension to the tumor.

The pituitary fossa has been arrived at either directly through the cranium or indirectly through the facial skeleton, the following table showing the routes which may be utilized:

#### CRANIAL

Temporal —  
Intradural (Horsley).  
Temporal —  
Extradural (Braun).  
Frontal (Krause).  
Fronto-orbital (Frazier).  
Callosal puncture.

## FACIAL

## Nasal —

Septal resection (Schloffer, Hirsch, West, Cushing, Kanavel, Halstead, etc.).

## Nasal —

Ethmoid resection (Hirsch).  
Paranasal (Chiari, Kahler).  
Palatal (Koenig, Preysing).  
Maxillary.  
Suprahyoid pharyngotomy.

Of these operations only four have been done in a sufficiently large number of cases to merit special attention.

Horsley's temporal method is done in two stages. A temporal bone-flap is made in the first stage, and in the second, the dura is incised and the temporal lobe lifted up, exposing the lateral aspect of the pituitary body. In Schloffer's method approach is gained to the nasal cavity either directly through the anterior nares, or by reflecting the nose, or by a sublabial incision. Varying portions of the septum and lateral walls of the nasal fossa are removed to furnish more room; the sphenoidal sinus is opened and through it the pituitary fossa is approached. Hirsch and Cushing do a most ingenious submucous septal approach, Cushing removing the vomer, part of the median plate of the ethmoid, and a strip of septum. The attachment of the septum to the sphenoid being exposed, the anterior and lower walls of the sinuses are chipped away and the floor of the exposed sella turcica removed. Hirsch removes the middle turbinates some days before the chief operation. The fronto-orbital method of Frazier is begun by forming an osteoplastic flap in the frontal region; the roof of the orbit is removed as far back as the optic foramen; the orbital contents are displaced downward and outward; the frontal lobe is elevated and the dura incised for a sufficient length to expose the contents of the sella. Other operations have rarely been performed.

The nasal route of Schloffer is fundamentally unsound, as are all of its modifications, excepting the submucous, as the sella is approached through a region teeming with organisms or harboring foci of infection in adjacent sinuses. Considerable deformity of the external nose may follow also. The same objections hold against the palatal method which traverses the septic post-nasal space and also against the Chiari-Kahler approach through the ethmoid by external incision. Though Kahler has had some success with it it is too early to say much in its favor. The temporal method has been found practicable by one operator only, but with a considerable mortality.

The only justifiable method of approach through the sphenoidal sinuses is that of Cushing or Hirsch, especially that of Cushing. Of 32 operations performed by the sublabial method by the latter operator, but one death occurred. With this method special skill in working in such a confined space is ne-

cessary as the surgeon cannot see what relationship his inserted spoon bears to the third ventricle. On several occasions it has been necessary to insert a metal clip for radiographic orientation purposes. A preliminary sounding of the sphenoidal sinuses is wise before undertaking this operation.

Facts in favor of the fronto-orbital method are that it provides an aseptic route, allows each step to be performed by the aid of sight, and does not necessitate much dislocation of the brain as with the temporal method.

The most common indication for operation is incoming blindness and it seems certain that in nearly all these cases there must be considerable intracranial extension. With the fronto-orbital method these enlarged glands present an easier object for attack. Some oedema of the eye occurs after operation and sometimes the eyeball may not be left quite on the same level as the opposite one. The latter drawback should be avoided by greater care at the time of operation. The frontal sinus is sometimes in the way, but by previous X-ray or transillumination it can be avoided.

While it is not possible to say which of the Hirsch-Cushing or fronto-orbital methods is to be preferred, the author believes that the latter is more suitable in the majority of cases.

E. K. ARMSTRONG.

## NECK

**Watson, L. F.: Quinine and Urea Injections in Hyperthyroidism.** *N. Y. M. J.*, 1916, ciii, 791.

The author briefly reviews some of the methods of recent years that have been instituted with the idea of controlling the hyperactivity of the thyroid gland. He emphasizes the necessity of rest, with proper dietetic and hygienic supervision, as the foundation for any procedure in the treatment of hyperthyroidism and urges that the other ductless glands as well as the thyroid in each patient be studied; their rôle in contributing to the symptoms ascertained and treated accordingly.

The author recommends quinine and urea injections to relieve hyperthyroidism only, and not to remove the goiter; however, small, recent goiters usually disappear following the treatment. Much depends upon a proper selection of cases. The technique is difficult and the method is suitable for use only in a hospital by men experienced in thyroid surgery.

The author describes an original method of raising the hyperthyroid patient's threshold to stimuli, by means of preliminary injections into the thyroid gland of a few minims of a sterile salt solution, followed by injections of sterile water, given at one- to three-day intervals. When no hyperthyroidal reaction follows the water injections their usefulness is at an end. If these preliminary injections are omitted, acute attacks of hyperthyroidism which might result disastrously are liable to



follow. It is important that the slight pain of the injection be minimized by the use of local anaesthesia. It is important that the patient does not come to dread the injections because the best results are secured through prolonged periods of treatment.

E. H. POOL.

**Marsh, M. C., and Von Willer, P.: Thyroid Tumor in the Sea Bass (*Serranus*). *J. Cancer Research*, 1916, 1, 183.**

The authors' contribution to the pathology of enlargements of the thyroid in fish is based upon five cases of thyroid enlargement observed in *serranus* (sea bass). The authors state that although thyroid tumors have long been known to occur in fish, they have not been observed until recently outside the salmonoid group, and only rarely outside of domesticated fish, where they are endemic and widespread.

The only case known to have occurred in fish from marine waters, besides the present specimens, is the case described by Cameron and Vincent. This was in a small shark of the genus *squalus*, of the Pacific coast of North America.

The authors report that of the five tumors, one specimen was plainly colloid goiter; one was microscopically a step in advance toward epithelial increase of large alveolar type and shrinkage of the colloid content. In another the epithelial outgrowth was predominant over the colloid, the cells having become high columnar, and the growth having taken on a definite adenomatous structure. In one case marked regression was indicated.

The growth in these specimens of *serranus* is not regarded as giving pronounced evidence of malignancy. Little infiltration is exhibited throughout the growth as a whole. In this respect the growths do not approach the process as exemplified in the fresh water salmonoids or in the case of *squalus*. The bodies of the fish were not examined for metastases. The authors believe the tumors to be true neoplasms representing early stages of processes which are of essentially the same nature as the other thyroid overgrowths in fish which have been the subject of investigation.

The authors call attention to the fact that iodine acting through the water medium, even in great dilution, has a marked action upon thyroid hyperplasia or more advanced overgrowth in fresh water fish, reducing the heightened epithelium, restoring colloid, and effecting regressive changes in general. They claim that their specimens are of additional importance from the fact that the fish were removed from the sea to an aquarium supplied with sea-water, and were habitually fed with marine fish, chiefly the pilchard (*clupea pilchardus*). They received no mammalian tissues. They acquired the growths in sea-water, which contains a far greater concentration of iodine than that which is effective in reducing thyroid hyperplasia in fresh water fish.

E. H. POOL.

**Gaylord, H. R.: Further Observations on So-called Carcinoma of the Thyroid in Fish. *J. Cancer Research*, 1916, 1, 197.**

The author reviews the literature of the so-called carcinoma of the thyroid in the salmonoids.

The disease was first described by Bonnet in 1883. Although this author did not recognize its nature, Scott in 1891 regarded it as cancer, and Plehn in 1902 recognized it as a neoplasm of the thyroid gland. In the same year it was described by Gilruth as epithelioma affecting the branchial arches. A comprehensive histological study based on some ten specimens of fish was made by Pick in 1905. The author's contributions to this subject date from 1908, with the description of conditions existing in a hatchery in which hundreds of fish were affected. The disease has been studied also by Marine and Lenhart, beginning in 1909, and they consider it to be endemic goiter. Gaylord's studies were published in monograph form in 1914, and led to the conclusions regarding the nature, distribution, and significance of the disease which are summarized in this article. Gaylord emphasizes the fact that the disease is endemic in a very high percentage of all trout hatcheries in the United States. He states that the occurrence of the disease in wild fish, its production in fish cultural stations, its localization in certain troughs of water supplies, the method of its spread, its transmission to mammals, the efficacy of three well known inorganic germicides in the treatment of the disease, the destruction of the agent by boiling, and the phenomena of spontaneous recovery and immunity strongly indicate that the agent causing the disease is a living organism.

Gaylord states that as there is no line of demarcation between what is called endemic goiter and what may be considered as cancer of the thyroid, endemic goiter and carcinoma of the thyroid in the salmonoid are identical.

The cases found in sea bass by Marsh and von Willer, the thyroid tumor found in *squalus*, or small shark, by Cameron and Vincent, together with the evidence which has been collected regarding the existence of thyroid carcinoma in fish living under natural conditions, and hence unaffected by over-feeding, overcrowding, etc., strengthen the conclusion that the disease is not the result of artificial propagation. The occurrence of the disease in sea fish bears rather strongly upon that theory of thyroid hyperplasia which attributes it to a deficiency of iodine in the food or environment. In fact, so far as fish are concerned, the similar results obtained with mercury and arsenic would seem to show conclusively that iodine acts in a manner similar to the metals, and not by supplying a deficiency of iodine in the gland.

The observation that mercury, arsenic, and iodine, when introduced even in small amounts into the water containing fish with thyroid tumors, bring about a marked diminution in the size of the neoplasm, develops increased significance in the light of recent experiments reported by McCarrison.

In discussing the question whether the iodine acted as a purifier of the water, especially as a germicide, or whether its effect was to be attributed to its supposed physiological influence upon the thyroid gland, McCarrison stated that he had obtained equally favorable results in the treatment of goiter with thymol; hence he was not inclined to attribute to iodine a distinctly physiological action in the treatment of goiter.

McCarrison's experiments do not show conclusively that the iodine worked by destroying an agent in the water supply, for the possibility still remains that it may have exerted some germicidal effect in the individual drinking the water. It is to be regretted, therefore, that he did not entirely substitute chlorination of the water for treatment with iodine.

E. H. POOL.

**Little, E. G.: Scleroderma Associated with Graves' Disease, and Later Myxœdema, Conspicuously Benefited by Implantation of Human Thyroid into the Bone-Marrow.** *Proc. Roy. Soc. Med.*, 1916, ix, *Dermatol. Sect.*, 69.

The case is described of a lady, aged 52, who in 1902 presented the symptoms of Graves' disease to a mild extent. In 1908 she developed myxœdema. Her pulse-rate, however, still continued to be 120 and her blood indicated marked anæmia. Periods of irregular fever with urticarial swellings, as well as pains in the shoulder and neck, bothered her so much that she had to be carried in a chair. The scleroderma became evident in 1910, affecting chiefly the fingers, forearm, face, and thighs. The stiffness became so extensive that she was greatly crippled. The mental accompaniments of myxœdema, dullness and lethargy, were conspicuously absent.

Implantation of thyroid was made into the tibia in 1911. Following this the scleroderma was much improved. She was taking iodothyrene at this time. In 1912 a second implantation of thyroid tissue was made. In 1913, pyorrhœa alveolaris was diagnosed. After having all her teeth removed, there followed a remarkable change in her general health and appearance, an improvement which has been steadily maintained. At present the fingers have become flexible enough to permit her to play the piano. The skin of the face is supple and otherwise normal.

H. G. SLOAN.

**Gronnerud, P.: The Technique of the Enucleation Thyroidectomy.** *Illinois M. J.*, 1916, xxix, 259.

This operation will be found practically applicable to all parenchymatous goiters, whether of the cystic, colloid, fibrous, or mixed variety, but should never be attempted under the vascular or active hyperplastic enlargements. It is a method very largely eliminating the use of clamps and accompanied by a minimum loss of blood, never followed by nerve complications, and when even mediocre surgical

judgment is available, of extreme breadth in application.

The usual low skin incision is made. The fascia is raised slightly and cut parallel to the contained veins and the cleavage line between the revealed edges of the sternothyroid and sternohyoid muscles observed. These muscles are separated and retracted, revealing the encapsulating fascia of the gland. It will thereupon appear that the true capsule of this organ blends with the so-called Kocher fascia and is very rich in arteries and veins. When the anterior fascia, which is comparatively free from large vessels, is opened the thyroid capsule will be seen. No clamps are used in these procedures, hæmorrhage so far being slight and automatically ceasing on the correct separation of the tissue layers. The true capsule is then opened into and, by posterior pressure, the tumor delivered. The tumor may be enucleated without difficulty, leaving a comparatively bloodless bed which depicts the arrangement of vessels in the true capsule.

In 98 thyroidectomies in which the above technique was followed, the application of clamps to the inferior thyroid artery was necessary in two cases, but, being inside the capsule, no injury to the nerve was possible; necessity for clamping the superior thyroid artery did not arise. EDWARD L. CORNELL.

**Petersen, W., Jobling, J. W., and Eggstein, A. A.: Serum Changes Following Thyroparathyroidectomy.** *J. Exp. Med.*, 1916, xxiii, 499.

The experiments here recorded were made on dogs. Thyroparathyroidectomy was performed in fifteen animals, and the serum changes were studied. The following two experiments were typical of the relations noted.

On the first dog, weighing 5 kilos, complete thyroparathyroidectomy was performed June 1, 1915. Tetany was observed on the third day following the operation; on the fourth day the dog showed no symptoms; but on the next day (June 5) there was marked tetany. The animal was found dead the following morning.

On the second dog, weighing 8 kilos, complete thyroparathyroidectomy was performed June 8, 1915. Tetany was noted on the afternoon of June 10th, again on the following afternoon, and the next morning (June 12) when the animal was killed.

In the first dog there was a gradual increase in the antiferment titer until the time of death, with an irregular protease curve. The maximum protease activity was noted in the animal during the time when the tetany was most apparent. The non-coagulable nitrogen of the serum increased to more than twice the original amount. The lipase remained constantly low. The proteoses increased markedly. The amino-nitrogen of the serum in this animal showed no change except an initial decrease.

In the second experiment the conditions were different. The antiferment titer showed marked fluctuation, the first decline appearing shortly after the operation. The protease remained low



until the last day, but the non-coagulable nitrogen increased as in the previous animal; the proteoses also accumulated during the period of tetany. The increase in amino-acids was similar to that observed in practically all the other animals during tetany. This was the only animal of the entire series in which a rise in the lipase titer was observed.

From their study the authors draw the following conclusions:

1. In thyroparathyroidectomized dogs the on-

set of tetany bore no constant relation to the ferment-antiferment balance of the serum.

2. The serum lipase titer remained at a low level throughout.

3. A progressive increase in non-coagulable nitrogen and proteoses was observed in the serum following the removal of the glands.

4. The amino-nitrogen of the serum was usually increased at the time when tetany was most marked.

GEORGE E. BEILBY.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Menzies, J. L.:** Notes on a Series of Seventy-five Gunshot Wounds of the Chest. *Brit. J. Surg.*, 1916, iii, 667.

The statistics of a series of 75 cases of gunshot wounds of the chest are reported by the author, and 12 of the more interesting cases are described in detail.

The most notable feature of the series is the rapid recovery where there was no destruction of the chest wall, as compared to the high mortality in cases with open wounds. Where the pleural cavity communicated with the outer air the results were almost uniformly fatal.

The symptoms are pain, shock, dyspnoea, and hæmoptysis, and are due to damaged lung tissue and the resulting escape of blood and air into the pleural cavity. Pain is always present but is rarely severe. On the other hand, shock is usually pronounced. Dyspnoea is almost always present and is most severe immediately following the wound, abating within twelve to twenty-four hours.

Hæmoptysis occurs in the majority of cases, seldom, however, being severe and lasting only two or three days. In the series, 27 had no bleeding; in 40 it came on immediately after injury, and in 8 it was delayed from one to twelve hours. In all cases there was a rise of temperature.

In the base hospital dyspnoea and pyrexia are the prominent symptoms, depending on the presence of an effusion and whether it is sterile or septic, the amount of effusion determining the degree of dyspnoea. In the series, effusion took place in 70; 49 were sterile; 10 showed slight infection and 11 marked infection.

Pneumothorax was present in 14 of the cases; in 8 it communicated with the outer air. Surgical emphysema was present in 12, and required no treatment. Twenty-seven cases were discharged as cured, with the missile retained but causing no symptoms.

The cases were divided into those with wounds which were healing or healed and those with wounds opening into the pleural cavity at admission. There were 67 cases in the first class and 8 in the second. Those of the first class were much more

favorable for treatment: 66 recovered and 1 died of sepsis. The majority of effusions were bacteriologically sterile.

In the second class there was marked destruction of the chest wall; all were infected (pyohæmopneumothorax) and the mortality was very high. Of 8 cases, 7 died. Autopsies showed extensive laceration of the lung with lung abscesses spreading from the track of the bullet.

In the entire series, 67 recovered and 8 died, the deaths being due to sepsis.

In the treatment, rest is paramount, morphia being used as needed.

When the effusion is found to be sterile it may or may not be removed, depending upon the case. If left alone recovery is prolonged.

If the effusion is infected, early drainage is indicated, resection of a portion of a rib with a large drainage tube giving the best results. With a large empyema cavity the prognosis is grave.

Early rising with general and breathing exercises was found most beneficial.

P. M. CHASE.

**Newbolt, G. P.:** Clinical Lecture on Cancer of the Breast. *Med. Press & Circ.*, 1916, ci, 326.

In the author's opinion, three reasons still militate against cancer of the breast: (1) bad advice of the family physician; (2) failure of the patients to report the presence of the tumor; (3) disinclination on the part of the patients to have the radical operation done. Another factor which influences the laity to believe that the tumor is not cancer is the fact that it is not painful.

The author lays stress on the fact that the nipple need not necessarily be retracted in cancer of the breast. He thinks that where the supraclavicular glands are involved, the outlook is extremely grave, and the prospect for cure quite remote. The prognosis usually depends upon the stage of the growth at which removal is undertaken, as well as the age of the patient. The prognosis in young and healthy persons is bad. The best results are in women over 50. In males the outlook is extremely poor. Attention is called to the frequency with which metastasis occurs in the opposite breast, sternum, spine, and hip.

H. G. SLOAN.

**Gatewood: Tuberculosis of the Mammary Gland.***Interst. M. J.*, 1916, xxiii, 272.

The author credits Astley Cooper with having described the condition in 1829. Dubar in 1881 first described the disease microscopically. Deaver collected 94 cases which were reported between 1914 and 1915, and Durante collected 150 cases in 1914.

Tuberculosis of the breast has been classified into primary and secondary groups, the primary group comprising only those cases in which the disease was limited clinically to the breast and the glands of the axilla of that side. Since no post-mortem has been made in which the condition was so localized, Gatewood is of the opinion that "all cases of tuberculosis of the breast are but secondary manifestations of tuberculosis elsewhere."

In the majority of cases the bacillus reaches the breast through lymph channels, probably a "retrograde embolic process." The disease usually occurs in the female breast. No cases have been observed before puberty, cases usually occurring between the ages of 30 and 50. The most frequent initial lesion is a painless lump in the breast. Any patient presenting a lump in the breast and complaining of pain in the region of the tumor on deep inspiration should be radiographed for tuberculosis of the ribs.

The progress of the disease is usually rapid. One breast is involved as a rule. The lymph-nodes are enlarged in from 60 to 70 per cent of the cases.

Fistule, retraction of the nipple, and enlarged lymph-glands on the affected side are the most constant physical findings of the disease. The majority of the cases present tumors; they may be discrete, disseminated, or become confluent. The consistency varies with the amount of liquefaction and caseation. The skin becomes adherent to the mass and assumes a dark red appearance; this is followed by a rupture, discharge of caseous material, and sinus formation.

Tuberculosis of the breast must be differentiated from syphilis and actinomycosis. Potassium iodide is almost specific for both.

The treatment of tubercular mastitis is surgical. The after-care is important. The use of tuberculin is of questionable value. ISIDORE COHN.

**Robinson, S.: Treatment of Chronic Non-tuberculous Empyema.** *Surg., Gynec. & Obst.*, 1916, xxii, 557.

Three types of cases are mentioned: (1) those with an operative drainage wound; (2) those with leakage through a *necessitatis* opening; (3) those with bronchial drainage. Several types of cavities are described and illustrated: lateral cavities, small and large, anterior cavities, posterior cavities, cavities in the upper thoracic segment, multiple cavities designated as generally fatal. A preliminary drainage operation regardless of previous openings is imperative at least six weeks previous to any operation for cavity obliteration. Operations for

obliteration should be without mortality. The Estlander, Schede, Wilms, Delorme-Fowler, and Sudek methods all possess advantages and also sources of error.

Muscle-implantation may be employed in cavities of moderate size, utilizing the latissimus dorsi muscle dissected from the Schede U-shaped flap. The operation is preferable to those requiring partial resection of the scapula, described by Sudek and others, the latter producing limitation of shoulder motion.

Another operation is described involving the infolding of lateral skin and muscle-flaps with exposure of the entire cavity for subsequent skin-grafting, or stimulation of granulations and epithelialization. Surgical success depends upon the choice of a single method or a combination of methods applied with accurate knowledge of the extent and location of the cavity, and with conservatism in the number of operative stages. The non-operative treatment of chronic empyema, such as vaccine-therapy and antiseptic injections, produce symptomatic relief, and a diminution in the discharge, but the relief is more apparent than real. These treatments are frequently misapplied and generally serve unnecessarily to postpone obviously indicated surgical therapy. Bismuth and vaseline injections (Beck's paste) are of definite curative value in cavities primarily small or reduced to suitable dimensions by operations.

**Ewing, J.: The Thymus and Its Tumors; Report of Three Cases of Thymoma.** *Surg., Gynec. & Obst.*, 1916, xxii, 461.

The thymus reticulum is composed of modified epithelial cells, while the parenchyma cells are lymphocytes which have wandered into the stroma from without. The evidence indicating the dermatosis of thymus parenchyma cells from the epithelial stroma is unsatisfactory.

General pathological conditions affecting the thymus include aberrancy of thymus tissue in thyroid; simple hyperplasia in status lymphaticus, Graves' disease, and simple lymphadenoma; exfoliation of reticulum cells in leukæmia and infections; cysts; and neoplasms. Cysts arise from persistent embryonal epithelial canals, from branchial and ventral ectoderm, from distended softened Hassall's corpuscles, and from lymphangiomata.

Neoplasms include round-cell growths, commonly classed as lymphosarcoma, and tumors composed of flat or cylindrical epithelium. There are rare myxosarcomata of congenital origin, but malignant tumors arising from the connective tissue probably do not occur.

The so-called round-cell tumors, properly called thymomata, are derived from the epithelial stroma cells, and may be distinguished from true lymphocytomata of lymph-nodes. The cells are not round lymphocytes but polyhedral, or cylindrical, or giant derivatives of the stroma cells. The same variations in structure are observed as in Hodgkin's



granuloma and reticulum-cell sarcoma of lymph-nodes. The clinical course of these tumors also varies from the character of a progressive granuloma to that of a highly malignant locally aggressive neoplasm which may produce widespread extensions and metastases. A notable feature is perforation of the chest wall. The anatomical position and peculiar structure usually permits a satisfactory diagnosis. Thymic carcinoma includes those tumors composed of pavement, cubical, or cylindrical epithelium, but there is no sharp dividing line between the two groups, and both arise from the reticulum cells. The parallel existing between thymic granuloma and thymoma on the one hand, and lymphatic Hodgkin's disease and reticulum-cell sarcoma on the other, suggests that in both organs an infectious agent initiates an infectious process which often runs into a neoplasm. Most reported cases of the transformation of Hodgkin's disease into sarcoma relate to mediastinal and probably thymic tumors.

The reported cases include a rapidly progressive febrile case with very extensive invasion of the neck, chest, and axillæ by a tumor of diffuse structure; a perforating sternal tumor of two years' progress, structurally resembling Hodgkin's granuloma, regressing under X-ray; and a slowly progressive thymoma of granulomatous type, limited to the mediastinum, and showing polyhedral reticulum cells and Hassall's corpuscles.

### TRACHEA AND LUNGS

**Moore, A. B., and Carman, R. D.: Radiographic Diagnosis of Metastatic Pulmonary Malignancy.** *Am. J. Roentgenol.*, 1916, iii, 126.

The authors give a report based on 71 positive cases examined at the Mayo Clinic by both clinical and radiographic methods.

#### LOCATION OF PRIMARY FOCUS IN CASES SHOWING RADIOGRAPHIC EVIDENCE OF METASTASES IN THE LUNGS

	No. Cases
Total number tabulated.....	71
Breast.....	20
Thyroid.....	8
Kidney.....	5
Soft tissues of forearm and shoulder....	6
Soft tissues of leg and thigh.....	6
Soft tissues of neck and face.....	5
Uterus.....	2
Esophagus.....	2
Prostate.....	2
Testicle.....	2
Hard palate.....	1
Larynx.....	1
Sigmoid.....	1
Adrenal.....	1
Lung.....	1
Abdominal and pelvic masses.....	4
Origin not determined.....	4

Men.....	32
Women.....	39
Average age.....	45.5 years
Average time since growth was noticed.	2.25 years

Histologic examination.....	59 cases
Carcinomata.....	40 cases
Sarcomata.....	16 cases
Hypernephromata.....	3 cases

Enlargement of superficial glands.....	35 cases
Enlargement of deep glands.....	8 cases
Other foci of metastasis.....	14 cases

Apparently no idea as to the presence of pulmonary metastasis can be gained from the extent of the primary growth. Many cases with extensive involvement showed no metastasis, while in many the primary growth was small and clearly operable except for the radiologic evidence of metastasis.

Fourteen of these cases showed metastasis in organs other than the lungs or lymph-nodes. The other organs most frequently involved were the liver, bones, and brain.

Of the patients operated on, 42 had been subjected to surgical procedure for the removal of the primary growth; of these, 19 showed local recurrence. The average time from the operation to the discovery of the metastasis was 15 months.

Cough was present in 32 cases. It was usually dry, hacking, and unproductive, expectoration having been noted in but 8 cases. Only 4 gave any history of blood-spitting. The so-called prune-juice sputum, regarded by some observers as indicative of this condition, was not observed.

Dyspnoea occurred in 30 cases. It was usually progressive and, when marked, tended to be spasmodic in character, quite often simulating asthma.

Pain referred to the thorax was noted in 14 instances, usually described as gnawing and not influenced by respiration.

There was both clinical and radiographic evidence of pleural effusion in 12 of the cases.

A very striking feature was the relative absence of definite physical findings.

The conclusions are:

1. Pulmonary metastatic malignancy is not an uncommon condition and may occur regardless of the seat of primary focus.

2. Pulmonary metastasis bears no relationship to the extent or duration of the primary focus.

3. The clinical picture in a majority of these cases is very indefinite, neither the subjective nor the objective manifestations being characteristic.

4. Metastatic pulmonary malignancy is a definite roentgenographic entity, appearing in the roentgenogram as clear-cut circumscribed areas of increased density.

5. In many instances the diagnosis can be established only by the roentgenogram. By routine roentgenographic examination of the thorax many patients suffering from malignancy will be saved from useless and unwarranted surgery.

DAVID R. BOWEN.

## PHARYNX AND ŒSOPHAGUS

**Hirsch, I. S.:** *The Roentgen-Ray Study of the Œsophagus.* *Interst. M. J.*, 1916, xxiii, 42.

Hirsch's paper is comprehensive. For a contrast mixture he uses a tablespoonful of bismuth subcarbonate (or subnitrate) stirred for about ten minutes with a teaspoonful of mucilage of acacia. The resulting mass is viscous, and by coating the walls of the Œsophagus outlines its lumen. The examination is essentially fluoroscopic, but plates are also made. The oblique view, either dorsoventral or ventrodorsal, is emphasized. Two periods in the act of swallowing, the buccopharyngeal and the Œsophageal, may be differentiated. The bolus is propelled by the pharynx into the Œsophagus with great force and rapidity. It is carried through the Œsophagus by peristalsis. Solid food is carried down solely by peristalsis, while liquids are ejected from the pharyngo-Œsophageal junction (introitus) to the cardia. The wave is deepest in the lower Œsophagus where it is necessary to overcome the sphincteric action at the cardia.

Foreign bodies are most frequently impacted at four points: opposite the cricoid cartilage; above the arch of the aorta; at the crossing of the left bronchus; and at the diaphragm.

Two great classes of spasm may be differentiated: the primary, so-called idiopathic spasm, the etiology of which is not clearly understood; and the secondary spasm, the reflex of irritation, inflammation, or ulceration. The former affects the lower end of the gullet, and leads to dilatation; the secondary spasm may involve any part of the lumen. Spasm is indicated by the arrest of the bismuth in a cone-shaped shadow at the constricted point. In the primary cases with dilatation there may be rapid, deep peristaltic waves moving to the base, with occasional regurgitation. The outline is smooth and symmetrical above the point of obstruction.

Benign, or scar stenosis is usually asymmetrically situated, while the extent of the stenotic area is short. Stenosis due to corrosives is most frequently found either at the pharyngeal mouth or in the upper dorsal part of the tube.

The commonest form of stenosis is that due to carcinoma. At least 70 per cent of patients complaining of dysphagia have this disease of the gullet. As a rule these tumors involve but a part of the surface of the tube; rarely do they involve its entire circumference. This accounts for the irregular, asymmetrical filling defect. Dilatation above it is never marked. Peristalsis is absent over the invaded area and distal to it.

Syphilis of the Œsophagus resembles cancer roentgenologically, excepting in regard to the multiplicity of the lesions.

Diverticula are of two varieties, pulsion and traction. The former are most common, are situated high, near the introitus, and appear as pouch-like adjuncts to the Œsophageal lumen.

ALBERT MILLER.

**Moore, I.:** *The Removal of Foreign Bodies from the Œsophagus and Bronchi; with a Description of Some New Instruments.* *Lancet, Lond.*, 1916, cxc, 992.

The author has designed a new non-slipping forceps for removing foreign bodies of any description. The blades are shaped on the principle of a crab's claw, the upper blade being curved and having at its extremity a triangle tooth which fits between two similar ones in the lower blade. Both blades are transversely serrated, giving greater security to their hold on a foreign body. They are in addition grooved down the center so as to prevent any lateral slipping. He has also devised an endoscopic cutting forceps or shears which combines both the grasping action of forceps and the cutting action of shears.

OTTO M. ROTT.

## SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

**Sampson, H. H.:** *Clinical Notes on Penetrating Wounds of the Abdomen.* *Brit. M. J.*, 1916, i, 547.

The extent of the visceral injury caused by rifle bullet in the abdomen depends to a large extent on the distance the bullet has traveled before the impact. The most extensive wounds are caused when the range is less than five hundred yards.

The importance of primary hæmorrhage lies in the fact that there is little tendency toward spontaneous arrest. When seen three or four hours after the receipt of the injury small arteries in the wounded bowel are still spurting vigorously. In fatal cases death is almost invariably due to primary hæmorrhage. It becomes obvious, therefore,

that on this account alone, every effort should be made to convey the abdominal wounds with the least possible delay to a place which is equipped for operative treatment.

One case is reported in which a bullet traversed the peritoneal cavity in an area occupied by intestines without causing perforation of the viscera, with which it must have come in contact.

Wounds of the small intestine are generally multiple but are usually confined to one segment of the bowel. Wounds of the colon are often complicated by injuries to other viscera. These cases show a high mortality. If, however, the injury is confined to the colon, the outlook is more hopeful, provided operation is performed before a widespread peritoneal infection has occurred.



Wounds of the stomach bleed freely, but if uncomplicated respond well to operative treatment. Wounds of the liver give the best results. In simple perforations, hæmorrhage is slight; bile drains away for a few days; recovery is the rule.

The spleen is seldom injured alone. Its injury is often associated with that of the left kidney, pleura, and lung.

J. H. SKILES.

**Fraser, J., and Bates, H. T.: Penetrating Wounds of the Abdomen.** *Brit. M. J.*, 1916, i, 509.

The authors report the operative results in penetrating wounds of the abdomen and discuss their observations in these cases.

In wounds of the stomach the degree of damage depends on the nature of the projectile and the part of the stomach injured. Shell fragments produce the most extensive destruction, while bullets generally behave as in other soft tissues, i.e., small entrance wound and larger exit wound. Bullet wounds of the center of the stomach produce the least destruction, those of the pylorus quite extensive laceration, while those of the greater or lesser curvatures are accompanied by widespread splitting and tearing of the tissues. Hæmorrhage is not severe unless one of the larger vessels is ruptured.

Clinically, this class of cases shows pain, sickness, collapse, abdominal rigidity and tenderness; the sickness being more pronounced than is usual, and the collapse less marked. The pulse and respiration rates are increased; the latter proportionately more rapidly than the former. Pain is more pronounced when the pyloric or cardiac ends are involved and collapse more marked in wounds of the curvatures.

In the operative treatment the authors employ a left rectus incision, occasionally enlarging it laterally. When the situation of the wound is doubtful an incision parallel to the left costal margin is used. After rigid inspection one of three lines of treatment is instituted: (1) simple suture, (2) gastro-enterostomy, or (3) pylorotomy with partial resection depending on the conditions found.

Six illustrative cases are described, 3 of which died, 2 recovered, and one was unoperated. Suture was used in 3 cases, gastro-enterostomy in one, and resection in one.

Bomb fragments wounding the small intestine cause small multiple wounds with invaginated edges and a marked tendency to surrounding hæmorrhage. Bullets traveling at high velocity cause small equally sized perforations; at low velocity they cause considerable destruction of tissue. Wounds by shell fragments are usually quite extensive. Wounds of the free edge of the gut involve more tissue destruction than those of the fixed or mesenteric border.

Bleeding from the small intestine is usually severe, especially in the jejunum, and mesenteric hæmorrhage is always progressive. It was also observed that the less the damage to the gut the

more likelihood there was of extensive peritoneal soiling. Massive injuries inhibit peristalsis.

Bullet wounds of the buttocks, it was noted, are liable to be followed by evidences of injury to abdominal viscera.

Clinically these cases show signs of beginning peritonitis coupled with those of hæmorrhage, the symptoms of bleeding coming on first, followed by those of peritonitis. The abdominal rigidity when bleeding is profuse, often disappears.

The author advocates the midline incision and a complete inspection of the entire small gut before deciding upon the best method of procedure. The various methods are: (1) simple suture; (2) resection followed by lateral or end-to-end anastomosis; (3) resection and temporary enterostomy.

With simple suture it was found essential that the wound be small, edges undamaged, and mesentery intact. Wounds by bomb fragments are ideal for suture. The wound edges were not excised and linen thread was used.

The indications for resection and anastomosis are: numerous perforations, extensive size and degree of injuries and involvement of related mesentery. This procedure is highly favored by the authors. They also prefer the lateral anastomosis as being less likely to be followed by paresis and distention of the proximal segment.

Resection and enterostomy are only indicated as an emergency measure in rapidly developing collapse during operation.

A synopsis is given of 21 illustrative cases: 12 died, 7 recovered and 2 were unoperated. Suture was done in 5, resection in 13, and enterostomy in one.

In wounds of the colon the effects of the different projectiles are similar to those in the small gut, with the exception that the septic material is much more likely to be walled off by adhesions. Peritonitis from such wounds, however, is intensely virulent.

Clinically the symptoms are likewise similar to those of wounds of the small intestine except in not being so widespread and with an absence of early sickness or nausea.

In the treatment, if the case comes to hand later than twenty-four hours, enlargement of the original wound and drainage is the best plan, on the possibility that the infection is becoming localized; earlier, it is wisest to open the abdomen through a separate incision. The methods best adapted to this class of wounds are simple suture and simple suture with colotomy, resection not being deemed advisable. Drainage of the retrocolic space is always recommended.

A synopsis of 12 illustrative cases is given; 7 died and 5 recovered.

In wounds of the spleen the presence of free fluid in the abdomen, evidences of hæmorrhage, and the exit and entrance wounds diagnose the condition.

Splenectomy is usually indicated.

Two cases are reported with one death and one recovery.

Wounds of the liver, gall-bladder and ducts are usually complicated by damage to the overlying lung or pleura. It is not usual to have much destruction or disruption of tissue in wounds of the liver and post-traumatic jaundice is uncommon.

The clinical symptoms may be remarkably absent, the lung symptoms frequently disguising the abdominal condition. Abdominal rigidity, increase of pulse, and temperature and pain over the liver were observed.

Cases showing progressive hæmorrhage or complications of other viscera only were operated.

A synopsis is given of 14 cases all of which recovered.

In kidney wounds, extensive organic disintegration may occur with merely slight wounds. Hæmaturia may or may not occur; in severe injury the kidney pelvis is usually blocked by a blood-clot.

Treatment consists in: (1) simple drainage, (2) kidney suture, and (3) nephrectomy.

Three cases are reported, all of which recovered, simple drainage being used in two and nephrectomy in one.

In wounds of the bladder, it was observed that intraperitoneal wounds are usually complicated by injuries to the rectum and small bowel, and that a non-penetrating wound of the abdominal wall may cause rupture of a full bladder. Clinically, the symptoms were the usual ones of bladder injury. Drainage, suprapubic, urethral, or perineal, was indicated. Four cases are reported with one recovery and three deaths.

In wounds of the rectum the entrance wound is usually in the buttocks and, as a rule, fracture of the pelvis and injuries to the small bowel complicate the case. Hæmorrhage is profuse, and appears from the rectum as well as internally. The treatment is that of the complications. Two cases are reported with two deaths.

The conclusions are as follows:

1. In the majority of penetrating abdominal wounds operation offers the best chance of success. Spontaneous recovery rarely occurs.

2. It is advisable to wait one or two hours for symptoms of shock to abate unless evidences of progressive hæmorrhage are found. Warmth and 1 ccm. of pituitary extract are used.

3. Three to four pints of saline administered subcutaneously during operation and closed ether anaesthesia are to be recommended.

4. Careful abdominal inspection and examination before instituting treatment is advisable.

5. In early cases of extensive peritoneal soiling the abdominal cavity is to be washed out. After peritonitis has set in, drainage only should be used.

6. Speed and every possible avoidance of shock are important factors.

7. Post-operative rectal saline and subcutaneous infusions are to be recommended.

8. The prognosis depends on the degree of injury

and the time elapsing before treatment is instituted. Early operation offers the best and surest chance of ultimate success.

P. M. CHASE.

**Abadie, J.: The Treatment of Penetrating Wounds of the Abdomen** (A propos du traitement des plaies pénétrantes de l'abdomen). *Bull. et mém. Soc. de chir., Par.*, 1916, xlii, 489.

The author reports on two series of observations: those treated by laparotomy, and those which recovered in spite of non-interference and in which the proof of penetration had been made either by X-ray or by visible lesions.

Laparotomy was performed on 15 cases in 9 months, including cases tangential to the peritoneum, univisceral, intestinal perforation, laceration of the liver, laceration and perforation of the intestines, perforation of the rectum, bladder, and small intestine; all these cases recovered. The cases upon which a laparotomy was performed and the individual succumbed included multiple sectioning of the small intestine, rupture of the urethra, perforation of the colon, crushing of the cæcum, perforation of the iliac fossa, and double perforation of the bladder.

It is generally admitted that wounds made by bullets are less grave than those inflicted by fragments of Howitzer shells. However, the proportion of cases wounded by one or the other means, depends upon where and how the fighting is carried on. The method of fighting in trenches, closely situated, explains the rarity of bullet wounds, and those occurring are extremely severe, due to the short distance. The author has never seen a case of a wound of the buttock with abdominal penetration recover without actual interference; the peritonitis reveals the seriousness of a small orifice of an anodic appearance. The presence of perforations or lacerations of the vesicle aggravates the prognosis considerably. One of the author's cases on whom he operated, recovered; three died.

Whether or not to operate at once in shock or to postpone the operation is a question of considerable importance. Frequently the wounded have to be carried for a distance of 12 kilometers, and as the shock reveals two essential causes, severe hæmorrhage or nervous shock, the selection of treatment is momentous. A hæmorrhage that has allowed a patient to be carried 12 kilometers could be modified momentarily in its effects by injections with serum and adrenalin; the nervous shock can assuredly be lessened by tonics. The method pursued by the author consists in: immediate injection with camphorated oil, ether, morphine, if the wounded suffers intensely, abundant injections with serum and 1 mg. of adrenalin; if intravenous injection is indicated, it should be given liberally. The injection with serum is continued even during the operation if it is indicated by the patient's pulse. In the majority of cases the author has poured 100 to 150 ccm. of ether into the abdominal cavity, notably the pelvic; the ansæ are cleaned by means of compresses im-



bibed with warm serum; in two cases he has replaced the ether by salt solution. Pelvic drainage has been practiced in all cases but one, sometimes a second drain is inserted toward the lesions. For lateral and terminal anastomoses, the author praises the efficiency of the coupled forceps of Temoin.

Post-operative care consists in absolute diet, Fowler's solution, by the drop method, rectally. A maximum absorption of 4 to 5 liters a day is considered sufficient.

The author recommends the establishment of surgical stations near the front; systematic arrangement in the immobilization of surgical ambulances for a small space especially for laparotomies; during fighting, specialization of a unit for that purpose, where the number of units is sufficient, if not, sending a reinforcing unit with assistants and all the material necessary for efficient treatment.

The author believes that the treatment of choice for penetrating abdominal wounds, in war as well as peace, is laparotomy. RAOUL L. VIORAN.

**Lancer, T. F.: The Acute Surgical Abdomen. *Med. Rec.*, 1916, lxxxix, 648.**

The author's paper is based on a recent series of unselected acute abdominal cases operated on by him at the St. Laurence Hospital, New York, most of them desperately ill, such as one finds coming into an emergency service by ambulance. He makes a special plea for the early recognition and prompt operative procedure in this class of cases.

The following is a classification of this series of 30 acute abdominal lesions:

In Group A, in 19 cases, or 63.3 per cent of the total, the appendix was the offender. Of these cases, 8 had had one or more previous attacks. In 6 cases the inflammatory process had not extended beyond the walls of the appendix; that is, they were operated upon early. In 10 cases of appendicitis, the damage had extended beyond its origin, causing a local peritonitis with limiting adhesions. In 3 cases diffuse peritonitis had resulted from delay in submitting to operative interference. Of these 19 cases of appendicitis, only 6 were seen early; that is, before the infection had extended beyond the appendix.

In Group B, in 5 of the total cases the uterine adnexæ were at fault.

In Group C, in 3 cases the biliary passages were the site of the lesion.

In Group D, there were 3 acute operative cases: a case of abscess between the layers of the mesentery of the small intestine; a subdiaphragmatic abscess of the left side, traumatic in origin; and a case of diffuse peritonitis thirty hours after perforation of a duodenal ulcer.

The leucocyte count proved valuable, especially in cases with little or no elevation of temperature, low pulse-rate, and slight abdominal signs, as in many of these cases the increased total count or preponderance of polymorphonuclear cells in the

differential count was the only evidence of the seriousness of the lesion.

Abdominal muscular rigidity, pain and tenderness, and a blood picture that shows a high total white cell count and a high percentage of polymorphonuclear cells in the differential count, or either one, constitute the "essential triad" for demanding operative exploration of the abdomen. The only exception would be in a case where the surgeon was sure that these signs were due to an acute salpingo-oophoritis which should be treated conservatively at the beginning. EDWARD L. CORNELL.

**Crispin, E. L.: Visceral Crises in Angioneurotic Oedema. *St. Paul M. J.*, 1916, xviii, 127.**

A large number of patients suffering from visceral crises, particularly of the erythemic, purpuric, angioneurotic group, are advised to undergo surgical operations.

The author calls attention to this group of cases and discusses the diagnostic importance of visceral crises more from the standpoint of value in negating or avoiding surgery which does not give relief than from the standpoint of too closely differentiating interrelated medical conditions.

Severe abdominal pains which do not conform to the true surgical types may be confused with visceral crises for which surgery would be of no benefit.

When a history of severe abdominal pain is given which does not conform to true surgical types, careful inquiry should be made as to the presence at any time of urticarias, erythemas, purpuras, and swellings of angioneurotic oedematic types.

A history of recurrent severe abdominal pains, with constancy in the nature and duration of the attacks, with skin manifestations of any of the exudative erythemic forms, with or without noticeable association with the abdominal pains, should excite suspicion as to the presence of crises of angioneurotic type.

A diagnosis of visceral crises of angioneurotic type should not be made until careful examination has excluded or made independent surgical causes. In this roentgenologic examination of the gastrointestinal tract is valuable negative evidence. Syphilis and tuberculosis should be excluded.

The constancy in the recurring attacks of pain not conforming to surgical types in patients who have had skin manifestations of the exudative erythema group and whose general condition does not account for the suffering they have had to bear will warrant a diagnosis of visceral angioneurotic oedema.

Repeated or even single attacks of intestinal colic, with tumefaction, in which the patient's general condition is too good for the extent and severity of the trouble and in which history of swellings can be obtained, may be of this type. To wait is good surgery. The rapid return to health is strongly suggestive of visceral angioneurosis.

Having determined the medical nature of these

angioneurotic visceral crises or even in these cases of angioneurotic oedema or the entire exudative erythema group, we should endeavor to work out the sources of toxæmia. These may be: foci of pus in the upper respiratory tract and sinuses, bacterial absorption, idiosyncrasies to heat, cold, chemicals, parasites, carbohydrates, or proteins that are the causes for anaphylaxis.

Removing the causes for anaphylaxis, whether it be idiosyncrasy, in one patient for ice cream — some constituent or the cold — banana in another, alcohol in a third, or any anaphylactic base or source of exogenous or endogenous irritation or poison, may give the patient relief that the advised surgery would not have given him.

EDWARD L. CORNELL.

**Makins, G. H.: A Study of the Symptoms and Complications of Gunshot Wounds of the Solid Abdominal Viscera.** *Brit. J. Surg.*, 1916, iii, 645.

The author reports his observations on a series of gunshot wounds of the solid abdominal viscera; these observations were made in a base hospital and do not include the immediate results of the wounds.

In wounds of the liver, especially those made by bullets, in many cases no evidence of liver injury is detected except that afforded by the course of the missile, provided the bile-duct or no large vessels are injured. Thirty-seven cases only are reported on the grounds that the liver wound was the chief element and as illustrating the varying degree of gravity which lesions of this organ may assume.

Two classes of wounds were observed: (1) those of a rupture due to contusion and (2) simple perforations. The liver, offering considerable resistance as it does, is frequently comminuted or ruptured.

The most common course of the missile is transverse. Of the 37 cases, 21 were transverse. Also the simple furrows often give rise to more troublesome and persistent hæmorrhage than the perforating wounds.

Shell wounds are usually most extensive; they frequently give rise to secondary hæmorrhage, and almost invariably are seriously infected from the start. Under these circumstances, it is the rule to have progressive necrosis and sloughing of a great part of the liver.

The most common coexistent injury is pleural and lung involvement. In the 37 cases, 25 showed pleural injury. Next in frequency come injuries of the stomach. Wounds of the right kidney are not rare but have a very good prognosis.

The symptoms and signs may be entirely wanting or very slight. Of the 37 cases, 7 showed no physical signs of liver injury. However, bleeding into the peritoneal cavity is one of the most common results and may lead to a rapidly fatal issue; at best, it is one of the most troublesome complications and is not often seen at the base hospital. If injury is on the inferior surface the blood will collect

in the lesser sac, and if on the anterior surface it will eventually collect in the pelvis.

Secondary bleeding usually occurs about the tenth day and is always associated with septic infection; in the series it occurred 4 times. It is accompanied by pain, abdominal distention, rise of temperature, and acceleration and loss of pulse volume.

In 12 of the 37 cases jaundice was observed, being deepest in serious septic infection. Deep staining of the urine is rare. It is believed to be hæmolytic in origin.

The most characteristic sign is the escape of the bile from the wound. Some form of biliary fistula was present in 15 cases of the series. Persistence depends mainly on the size and degree of infection of the wound. Of the 15, 7 showed fistula opening by way of the pleura, and all recovered. In none was the collection of the bile in the peritoneal cavity noted and in none was the gall-bladder perforated.

With an open infected shell wound temporary suppuration is the rule but is of no great importance. The formation of secondary abscesses, however, is a grave matter. In the 37 cases, 4 subphrenic abscesses developed with 2 deaths and 2 recoveries.

The post-mortem records show that of 25 deaths 60 per cent were due to sepsis and 40 per cent to secondary hæmorrhage. The most prominent complication causing death was hæmothorax; 7 cases died from infection from the effusion. There were 3 cases in which kidney wounds complicated the liver injury. Practically all the deaths may be said to be due to sepsis, as secondary hæmorrhage is always due to infection.

The treatment at the base hospital is purely expectant. If the missile is easily accessible, it may be removed, otherwise no fresh incision is made.

In wounds of the spleen, diagnosis is rarely made on any grounds beyond the position of the external wounds and the direction of the internal track. Left hæmothorax is the most prominent complication, followed by renal injury.

Spontaneous healing is to be expected with simple perforations and moderate lacerations of the spleen. Death from hæmorrhage from this organ is not at all common.

Injuries to the pancreas are just as difficult to diagnose as those of the spleen and are usually found at operation or autopsy. Three cases of wounds of the pancreas are cited.

In injuries to the kidneys the simple perforations may often be regarded as negligible. Twenty-seven cases are included under this head as showing the complications most frequently associated with injuries to the kidneys. In 21 of these cases the wound of entry or exit was in the loin.

The most common complications outside of injuries of the hollow viscera are wounds of the liver, spleen, and pleura.

Among the signs and symptoms, hæmaturia is the most prominent, although often absent. It is rarely severe or persistent. In the series, only 11



showed primary hæmaturia. Likewise, the degree of hæmaturia in no way accords with the severity of the damage to the kidney.

Two interesting cases of kidney wounds are described.

Secondary bleeding occurred in 12 cases, usually about the fourteenth day. In every case the urine was infected. Hæmorrhage occurs either as a persistent hæmaturia or as a perirenal hæmatoma. This latter as a rule travels into the iliac fossa and along Poupart's ligament, and is accompanied by the development of gravitation ecchymoses of the overlying skin. There is also a slight rise of temperature.

Intraperitoneal hæmorrhage is usually immediately fatal.

Extravasation of urine is not common. It is believed that the recently wounded kidney does not secrete actively, as the escape of urine externally during the first 24 or 36 hours is not abundant. Escape of urine externally was noted in 7 cases of the series. This condition is more marked where the kidney pelvis is injured.

The most common direct cause of death is secondary hæmorrhage. In 17 fatal cases, 7 were due to this condition.

Of fatal complications, the liver was wounded in 6 cases, the spleen in 2, the spine in 1, and hæmothorax developed in 3.

In the treatment, rest is paramount. Operation is rarely required for primary hæmorrhage. However, if the kidney is hopelessly damaged it should be removed.

For secondary hæmorrhage, nephrectomy is indicated and is often difficult owing to the comminution of the organ and the extravasation of blood.

A large blood-clot in the bladder should be removed by a lithotripsy evacuator or by suprapubic cystotomy. In primary hæmorrhage, suture, packing, or partial removal may be tried. Of 8 nephrectomies, 6 recovered.

P. M. CHASE.

#### Wells, B. H.: The Care of Abdominal Surgical Cases. *Am. J. Surg.*, 1916, xxx, 105.

The patients are first seen, examined, and treated at the dispensary of the New York Polyclinic, so that a knowledge of their general physical, as well as their pelvic and abdominal, conditions is obtained. If operation is considered necessary, they are admitted to the hospital and prepared, the preparation usually being very simple and consisting of a mild laxative on the morning of the day preceding operation, followed by an enema in the evening, together with the preparation of the skin.

Severe purging is avoided as being unnecessary and weakening, as well as a source of great discomfort to the patient. (The author strongly emphasizes this point, as there are still many who employ drastic measures to clean out the intestinal tract.)

Usually the evening before operation the abdomen is shaved and scrubbed with a tincture of green

soap and warm water applied with a piece of clean gauze. The soapy water is carefully and completely washed off and the skin dried with alcohol and covered with a light dressing of sterile gauze. When the gauze is removed before operation, the dry skin is painted with a 3.5 per cent tincture of iodine. In emergency cases the preliminary preparation may be omitted and the operation safely performed a few minutes after the iodine painting.

A moderate Trendelenburg position is used in nearly all cases except in acute appendicitis and where there is reason to fear some valvular lesion of the heart or degeneration of the cardiac muscles.

Gentleness of manipulation is strongly urged; no rough handling or sponging of the peritoneal surfaces is allowed. The vessels are ligated before being divided and clamps are never applied except to tissues that are to be removed. This is an important means of avoiding thrombosis and consequent embolism. Great care is taken to repair all torn or denuded peritoneal surfaces.

Before the patient is taken off the table, she is given a hypodermatic injection of atrophine sulphate, gr. 1/120, followed in a few minutes by one of eserine salicylate, gr. 150. The eserine can be repeated at six-hour intervals as needed. It is found to have a positive effect in relieving post-operative pain and in helping to blot out the recollection of pain. It lessens nausea and shock and promotes intestinal peristalsis. Morphia is needed to control pain in only one case in four and then rarely more than one dose of a sixth or a quarter of a grain.

After a long anæsthesia, the stomach is washed out at the end of the operation. If there is vomiting, water with a little bicarbonate of soda is given freely by mouth and, when the condition will permit, the head and shoulders are raised. To relieve shock, to supply fluids, to promote peristalsis, and to control thirst, a half pint to a pint of pure water is given per rectum every four hours until the bowels move or until the patient can take fluids by mouth.

After operation the patient is allowed from the first to turn in bed or be moved by the nurse. On the fourth day, unless there is some contra-indication, she is lifted out of bed into a chair for a short time, say a half hour. The time out of bed is gradually lengthened, as the patient's strength increases, to an hour or more twice a day and the patient is encouraged to take a few steps so that by the end of the week she is able to walk freely.

In the last 500 abdominal cases recorded, there were 11 deaths: 3 from embolism, 3 from sepsis, one each from pneumonia, general peritonitis, exhaustion, ileus, and intestinal obstruction.

The complications were as follows:

Deep wound infection.....	6
Skin infection.....	13
Hæmatoma.....	10
Fæcal fistula with spontaneous healing.....	2
Hernia.....	1

EDWARD L. CORNELL.

**McCrae, T., and Coplin, W. M. L.: Galatinoid Carcinoma (Morbus Gelatinosus) of the Peritoneum.** *Am. J. M. Sc.*, 1916, cli, 475.

An account is given of a case of gelatinoid carcinoma of the peritoneum in a male negro, aged 41, who had been troubled with chronic ascitis for four years, and had had 57 successful tapplings. For three years the fluid showed no particular features, then gelatinous colloid material appeared and was present for a year until death occurred. During the greater part of this period the patient's condition was excellent. The liver and spleen showed enlargement at one time and later became reduced in size. Shortly before death many hard, round, movable masses were found in the abdomen. There was intractable diarrhoea for the last few weeks of life.

At autopsy it was found impossible to find the primary seat of the disease because of the matting together of all the viscera. The diaphragm had been perforated by the growth and metastatic nodules were found in the lungs. The universality of the retrograde changes in the epithelium, not commonly encountered in cancer, the authors think was due to some condition which their study failed to disclose. Apparently the proliferating epithelium encountered some antagonistic influence which was constantly breaking it down. Complete early removal of the disease may be curative. Even incomplete removal of the mass may be followed by long intervals before recurrence takes place.

H. G. SLOAN.

**Handley, W. S.: A Method of Treating General Peritonitis with Obstruction; Its Application in Military Surgery.** *Brit. M. J.*, 1916, i, 519.

The author discusses those cases of general peritonitis in which the accepted modes of treatment have failed to avert or relieve paralytic obstruction of the bowels and cites a case successfully treated along lines laid down in his article.

In cases of general peritonitis where the picture is one of complete obstruction death is only a matter of hours. Immediately preceding this stage, however, is one not described in textbooks, wherein, while obstruction is usually complete, the pulse is relatively good, the vomit is not offensive, and the abdomen rigid below the umbilicus but moderately soft above with slight respiratory movements. This is the last stage in which surgical interference may help.

Fortunately, general peritonitis is rarely universal. The infection no matter where its source, as a rule begins in the pelvis and gradually spreads upward, gravity having carried the septic material downward. Thus there is quite a period in the disease in which the upper abdomen, i.e., above the umbilicus, is comparatively free from infection.

Likewise the presence of persistent active vomiting may be considered hopeful, in that it shows that the stomach and upper intestine still retain their contractile power, although reversed. Hence,

Handley believes that surgical interference in the upper abdomen before general collapse, is advisable and should be considered. The interference should involve only the stomach, jejunum, and transverse colon.

Jejunostomy fails it is believed because it cuts off the supply of fluid to the mucosa of the large intestine. Handley, however, recommends a jejuno-colostomy to the transverse colon with cæcostomy and pelvic drainage. This relieves the vomiting, establishes an emergency intestinal canal which supplies the body with clean food and fluid, conditions necessary to overcoming the general infection.

This procedure the author states may be carried out quickly and easily and practically without shock.

A case is cited in which after an operation for pelvic appendicitis with beginning peritonitis the symptoms of intestinal obstruction supervened giving a characteristic picture of ascending peritonitis with intestinal obstruction. A jejuno-colostomy with a cæcostomy was then done with immediate improvement and complete recovery.

In closing Handley states, "I hold no brief for my conclusions and only ask that they shall be tested."

P. M. CHASE.

**Saliba, J.: The Antiseptic Action of Ether in Peritoneal Infections.** *J. Am. M. Ass.*, 1916, lxvi, 1295.

Saliba states that he has introduced ether into the abdominal cavity as a routine measure in 248 hospital cases of peritoneal infection. The injection is made with a syringe just before the last peritoneal suture is tied.

He concludes as follows:

1. Ether experimentally and clinically has been proved to have a bactericidal action.
2. In peritoneal infections it is a safe and beneficial antiseptic.
3. The dose of ether instillation into the peritoneal cavity is one ounce for a child above four years and three ounces for an adult.
4. Generally no untoward after-effects and complications follow its use.
5. Any possible toxic action of ether on the various body organs is very slight.

A. EHRENFRIED.

**Finochietto, R.: Retro-Inguinal Hernias.** *Surg., Gynec. & Obst.*, 1916, xvii, 554.

Retro-inguinal hernias (Corbellini, 1906) are the right hernias of the classics, the internal hernias of Tillaux, the "juxtafuniculaires" of Villete.

They are called retro-inguinals, because coming outside, they push before them the posterior wall of the inguinal canal, the transversalis fascia. They are found in 10.63 per cent of hernias, coming to operation. The principal alteration of the walls is an atrophy of the conjoined tendon and Hessert's triangle.

The hernial tumor is slightly attached to the cord, but its base is fixed, owing to its continuity with the



transversalis fascia, which in this place presents its fibers of re-enforcement, strong, but separated.

According to the predominant element in the hernial tumor, i.e., the peritoneal sac, the preperitoneal fat, or viscera, the hernias are classified in the order of their frequency: sacular 73 per cent, lipomatous 20 per cent, splanchnic 6 per cent. In the lipomatous variety, occupying the under part of the base of the hernia, there is found an ample cavity, with walls formed by connective tissue, which is a prolongation of Bogros' space. These three varieties of retro-inguinal hernias are independent of each other; they do not follow one another.

**Simmons, C. C.: The End-Results in Seventy Consecutive Cases of Umbilical Hernia Operated upon at the Massachusetts General Hospital.** *Boston M. & S. J.*, 1916, clxxiv, 342.

The length of time the cases were followed after operation was from one to four years. Cases without recurrence at the end of one year were considered cured, since the records showed that all previous recurrences took place within one year from operation.

The operations reported were performed by 21 different surgeons. The three main types were: (1) closure of the ring vertically with or without an overlapping of the aponeurosis; (2) transverse closure of the ring without overlapping; (3) transverse closure with overlapping of the aponeurosis—the Mayo operation. The author described his technique in the last method which he has used in 14 cases without recurrence.

Simmons divides the cases into three groups: (1) children and small herniæ in thin adults, 15 cases, 10 traced, all cured by various types of operation; (2) stout adults, 45 cases, one death directly attributable to the operation for hernia, a mortality of 2.4 per cent. Six cases of strangulated hernia were included in this group. Of these 45 cases, the hernia recurred in 10, or 22.2 per cent. In 30 cases closed by the Mayo method 10 per cent recurred. In 14 cases closed vertically with or without overlapping, 42.8 per cent recurred. Local sepsis apparently played little part in the recurrent cases of 31 clean cases, 6 recurred; of 14 in which there was local sepsis, 3 recurred. Of the recurrent cases 4 were sutured with chromic gut, 2 with kangaroo tendon, and 3 with non-absorbable material.

The recurrent cases are described in detail and the cases in each group carefully analyzed, the following conclusions being reached:

1. Small umbilical herniæ in thin adults, and umbilical herniæ in children, may be cured by any operation which removes the sac and closes the defect in the abdominal wall.

2. Cases of umbilical hernia in stout adults are difficult to cure. The Mayo operation of transverse closure of the ring with an overlap of the aponeurosis gives the best results.

3. In adults closure of the ring by any other method than the Mayo, in a general hospital, is followed

by 46.4 per cent of recurrences. Recurrence, if it is to take place, usually does so in less than one year.

4. The suture material employed has no relation to the liability to recurrence.

5. Skin sepsis is very likely to occur, but apparently has no relation to recurrence.

E. FISCHEL.

## GASTRO-INTESTINAL TRACT

**Gasbarrini, A.: The Ionic Concentration of the Gastric Contents in Some Stomach Diseases** (Sulla concentrazione ionica del contenuto gastrico in alcune malattie dello stomaco). *Internat. Beitr. z. path. u. ther. d. ernahrungss.*, 1915, v, 391.

The author used Sorensen's lately introduced calorimetric method of estimating the ionic concentration of the gastric contents. This ionic concentration gives an index of the disassociation of hydrochloric acid; i.e., of the amount of free hydrochloric acid in the stomach.

The author submitted to this process the gastric liquids from 36 patients with various stomach diseases and from his results he is of the opinion that the calorimetric method is excellent for clinical diagnostic examinations.

The method and technique are fully described, also a detailed tabular statement is given of the 36 cases examined — gastric ulcer, dyspepsia, etc.— and the findings in each case. W. A. BRENNAN.

**Friedman, J. C.: Time Relations of Gastric Pains, with Special Reference to Gastric Adhesions.** *Am. J. M. Sc.*, 1916, cli, 735.

Friedman reports a number of operated cases of gastric pain with special reference to the time of occurrence as a diagnostic help. He divides all gastric discomfort of the intragastric and perigastric regions into continuous and intermittent varieties. The continuous pains are most frequently due to carcinosis, to marked pyloric obstruction, and to penetrating ulcers, with peritoneal involvement. The intermittent pains are divided into immediate, early, and late. The immediate are found frequently in ptosis, neurosis, obstruction of the cardia, and various other conditions.

The early pains, including those occurring fifteen to sixty minutes after eating, are most often due to adhesions in any part of the stomach, including ventral hernias and pericholecystitis.

Late pains include those occurring one to three hours after eating, and indicate an increase in intragastric pressure or pylorospasm, of which the most frequent cause is hyperacidity. J. W. TURNER.

**Barbacci, O.: Gastric Volvulus in Hour-Glass Stomach of Congenital Malformation; 360° of Rotation** (Volvulo gastrico in stomaco a clessidra per malfornazione congenita—360° di rotazione). *Riforma med.*, 1916, xxxii, 141.

Volvulus of the stomach is undoubtedly a rare affection and there are only 39 observations of it

on record. In recent years it has been seen more frequently than in the past owing to the greater number of surgical interventions. The affection occurring in a so-called hour-glass stomach where the rotation is in only one gastric segment is still rarer. There are only 10 observations of this kind. It is exceptional for the rotation to exceed  $180^{\circ}$ . Only 3 cases have previously been recorded in which the rotation reached the limit of  $360^{\circ}$ . The author now adds a fourth to these 3 cases. The clinical history of the case is wanting. The patient reached the hospital in a moribund condition and died shortly after his entrance. The particulars were gleaned from the autopsy. On opening the abdomen there was found in the left precordial region a sac the size of a child's head, of semi-ovoid shape, the base being above and the apex below. It reached to the level of the iliac crest, at which point it was twisted upon its axis and evolved into another apparently smaller sac of semilunar shape, which occupied all the right hypogastric region and had a general direction from left to right. On the left of this sac were two greatly distended loops of intestine, the upper corresponding to the descending colon and the lower to the sigmoid colon which was buried in the lower pelvis. On the right side of the sac was another distended loop which corresponded to the ascending colon. The viscera generally were malformed and displaced.

The lower of the two sacs referred to has undergone a torsion on its axis. This torsion amounts to  $360^{\circ}$ , so that the anterior face of the sac which is presented to view is really the visceral anterior face after a complete twist. This torsion is verified by complete removal of the sac and its attachments.

From the detailed findings the anatomic diagnosis was: gastric volvulus in bilocular stomach with  $360^{\circ}$  of rotation; abnormal mobility of the pylorus and duodenum; congenital malformation of the gastrohepatic ligament; slight pulmonary emphysema with hypostasis and oedema; degeneration of the myocardia and liver; hepatic calculus; incipient aortic, splenic, and renal arteriosclerosis, etc. Histologic examination showed no alteration whatever in the stomach walls in either sac.

The author thinks the two conditions in this case which merit special attention are the bilocular conformation of the stomach and the gastric volvulus. Bilocular stomach is not rare. It may be congenital or acquired, although many authorities deny the existence of a congenital variety.

The author is convinced that in his case the deformity was congenital and gives his reasons, discussing the theories of other writers, Barnabo, Veyrassat, Buedinger, Wallstein, etc., who have devoted considerable attention to the occurrence of this congenital anomaly. Veyrasset has laid down the dictum that in order to be considered congenital the following should be fulfilled:

1. The biloculation should not cause any gastric disturbance during life.

2. It should not disappear under the influence of insufflation of the stomach.

3. It should not be accompanied by any appreciable lesion of the gastric tunica.

Biloculation is as likely to be met with in the foetus and in the infant as in the adult and the old.

In the author's case the second and third conditions were fully met. The first conditions could not be established owing to the lack of a sufficient history of the case.

The author next takes up in detail the consideration of volvulus occurring in connection with bilocular stomach. From a review of the literature of the subject he reduces such cases to 10 only. He gives a short résumé of these 10 cases. Only in the 3 cases reported by Hedlung, Schuele and Walther, and Kocker did the rotation reach the limit of  $360^{\circ}$  as in the author's case; and that of Schuele and Walther was the only one in which the other concomitants agreed with those of the case now reported. The author's case is therefore unique.

W. A. BRENNAN.

**Burge, W. E., and Burge, E. L.: The Cause of Gastric Ulcer.** *J. Am. M. Ass.*, 1916, lxxvi, 998.

In accordance with the theory that gastric ulcer is caused by decreased resistance in the limited areas of the gastric wall, the authors undertook this investigation to determine experimentally if possible whether or not such diminished resistance would give rise to gastric ulcer. They point out what has been known for some time: that the resistance to the action of the digestive juices of limited portions of the mucosa of the stomach is decreased by cutting off the blood supply to these portions as, for example, by a clot in a small blood-vessel (thrombosis) or by the ligation of the vessel, and that under such conditions the area is digested by the pepsin with the formation of an ulcer. The fact that gastric ulcer occurs so frequently in anæmic persons led to the advancement of the theory that the oxidative processes are decreased and that this may be the cause of the diminished resistance of the tissues.

Working upon the theory which assumes that normally a balance exists between the oxidative processes of the cells of the mucosa and the digestive action of the pepsin in the stomach, and that if this balance is destroyed, as for example by depriving a limited area of oxygen by cutting off the blood supply and thereby decreasing the oxidative processes of the area, this area should be digested by the pepsin with the production of ulcer, the authors devised numerous experiments to imitate the protective mechanism as thus set forth. From their experiments they are able to draw the following conclusions:

1. The decreased resistance of a circumscribed area of the stomach to the digestive action of gastric juice is due to a decrease in the oxidative processes of the cells of the area. Gastric ulcer is due to the subsequent digestion of the area by pepsin.

2. The resistance of unicellular organisms (para-



mecciums) to the digestive action of the proteolytic enzymes can be increased or decreased by increasing or decreasing the intensity of the oxidative processes of the organisms; the greater the intensity of the oxidative processes the greater the resistance, and vice versa.

GEORGE E. BEILBY.

**Elliott, T. R., and Henry, H.: Traumatic Gastric Ulcers.** *Brit. M. J.*, 1916, I, 523.

The formation of gastric ulcers following trauma to the stomach is discussed.

Surgical work with the army in France has proved conclusively the value of early operation in gunshot wounds of the abdomen. It is the consensus of opinion that any wound of the intestinal tract is less likely to be fatal if repaired immediately than when left to rest and nature, although Surgeon General Sir George Makins claims that it is unwise to open the abdomen in cases where only the stomach is supposed to have been wounded.

While the chief danger in intestinal wounds is from peritonitis, in stomach wounds it is less to be dreaded, as frequently adhesions seal the aperture and the gastric contents that do leak out are not very septic. However, the real danger in this latter class is from secondary hæmorrhage due to erosion of the injured tissues by the gastric juice.

Immediate hæmatemesis and melæna are rare as the bleeding is usually intra- or retroperitoneal. However, these symptoms often appear during the second week and then are to be interpreted as due to an extending ulcer of the stomach or duodenum. These ulcers are the exact counterpart of the non-traumatic ones with the exception that gastric fissure is much more liable to formation in the track of the initial injury.

A detailed clinical report is given of the 4 illustrative cases, 3 of which died, 2 from uncontrollable hæmorrhage and one from widespread septic infection. In all 4 cases the missile either penetrated the stomach or came so close as to cause a direct injury to the wall. None of the cases was operated upon and hæmatemesis and melæna occurred in each during the second week.

In the case which recovered, the stomach was probably contused and recovery from following ulcer unexpected, as the rule in these cases is subsequent death.

P. M. CHASE.

**Verbrycke, J. R., Jr.: Post-operative Treatment of Peptic Ulcer and Cholecystitis.** *Med. Rec.*, 1916, LXXXIX, 774.

The first step in the post-operative treatment begins at operation. Whenever possible, the ulcer should be excised, kept from contamination, and examined for organisms from which autogenous vaccines can be prepared and administered during convalescence.

There can be no routine treatment for ulcer after operation. The individual patient must be treated, bearing in mind the possible cause of the trouble,

the character and position of the ulcer found at operation, and the nature of the operation itself.

In cases of excision it is necessary simply (1) to regulate the diet for from ten to fourteen days; (2) to administer atropine or belladonna to prevent spastic contraction of the pylorus which would tend to produce further trouble; (3) to make and administer autogenous vaccine; (4) to avoid irritating purgatives; (5) before the patient is discharged to make search for the original focus if it has not already been located and take steps to eliminate it; and (6) to instruct patients to report at least every two months for a year with a specimen of stool, while on meat-free diet for three days, to be examined for occult blood.

Not only does the location of the ulcer influence the after-treatment, but also the conditions found at operation. A large callous ulcer of many years' duration, if ever curable by rest, will certainly take longer than a small non-indurated one. Perforated ulcers, naturally, demand certain other treatment which comes purely under the domain of the surgeon, such as (in acute cases) the Murphy salt solution and the Fowler position. For some reason perforated ulcers seem to tend to heal without much difficulty after the perforation is closed.

Ordinarily results in gall-bladder cases may be said to be decidedly better than those following operations for ulcer; however, the number of secondary operations required and the not inconsiderable number having a continuance or recurrence or trouble after drainage or even removal of the gall-bladder would indicate that there is room for improvement in the treatment. The author believes that the reason for many of the poor results lies in the fact that the original factors which caused the trouble have not been influenced.

The patient should have an individual diet list based upon the condition of digestion and the weight, but in all cases fat should be restricted to a greater degree than the other food products. In the obese fat reduction should be practically absolute for a time so that the patient may use up some of his own. Some control should be kept over the fat ingested for at least a year. If the bowels tend to become sluggish from the absence of fats, mineral oil, which lubricates without being digested, may be given.

Next to fats the carbohydrates should be restricted. Judgment is required in determining how far this may be safely carried. Proteins are allowed in sufficient quantity to maintain nitrogenous equilibrium. All of the vegetables that are desired may be taken, also fruit, provided the chemical condition of the stomach does not contra-indicate its use.

The bowels should be kept open. Plenty of water will help, with the addition of Carlsbad sprudel salts when required.

After convalescence exercise should be prescribed. Outdoor exercises, such as walking and golf, are especially desirable, also special abdominal exercises which tend to reduce the fat, stimulate the circula-

tion, and correct sluggishness of the biliary as well as the whole digestive tract.

Post-operatively 15 grains of hexamethylenamine a day should be given for a number of months unless contra-indicated by some untoward action. One five-grain tablet of sodium glycocholate or its equivalent two or three times a day should be administered for some months.

Thyroid extract, for its action on fat metabolism, should be used temporarily in the cases in which it would seem that there was deficiency of thyroid secretions with poor oxidation. Small doses should be used at first and close attention paid to the blood-pressure and pulse. EDWARD L. CORNELL.

**Mackay, W. A., and Macdonald, I.: Perforating Pyloric and Duodenal Ulcers.** *Edinb. M. J.*, 1916, xvi, 280.

The article briefly reports three cases of perforating pyloric and duodenal ulcers with operation. One died and two recovered. These three cases were from a series of 250 operations for gastric and duodenal ulcers occurring in the authors' experience in southern Spain.

All the cases gave the typical history of duodenal ulcer of several years' standing.

In the first case, perforation occurred in the middle of a large oedematous mass occupying the pylorus, which prevented the sutures from holding. Under these circumstances, the abdomen was thoroughly dry-swabbed and the pyloric portion of the stomach belayed to the abdominal wall. Two drains through the incision and one through the loin to the kidney pouch were used, being removed on the ninth day. Uneventful recovery followed and two months later gastro-enterostomy was done.

In the second, perforation occurred in an ulcer densely adherent to the posterior border of the liver making suture impossible. The leak was stopped by an omental tag, the abdomen dry-swabbed, a large drain put under the liver, another through the lower end of the incision and a third over the pubis into the pelvis. This patient suddenly died on the fourth day after developing a duodenal fistula.

In the last case, a small perforation occurred in an old ulcer scar on the front part of the duodenum. This was closed by a single catgut suture followed by continuous suture of the serous coats, and a tag of gastrohepatic omentum sutured over all. Following this a posterior gastro-enterostomy was done. One drain was then placed under the liver and a second above the pubis into the pelvis. These were removed on the third day and uneventful recovery followed.

The authors strongly recommend pelvic drainage and immediate operation. P. M. CHASE.

**Morgan, E. A.: The Post-Operative Management of Pyloric Stenosis.** *Am. J. Dis. Child.*, 1916, xi, 245.

The author's study is based on the personal observation of fifty children who were operated on in

the Babies Hospital of New York during the last two years. The post-operative results are dependent to no little extent on the pre-operative condition of the patient.

The maintenance of the body temperature is of paramount importance. A sudden loss of body heat has, in some instances, been the undoubted cause of collapse occurring a few hours later.

The greatest danger is in the exposure incident to the operation, and to minimize this it is advisable to encase the infant's legs and arms in non-absorbent cotton. Under the pad on the operating table is placed a hot water bag which fits into the small of the back and serves the double purpose of supplying warmth and keeping the site of the operation well elevated.

The removal from the infant's stomach, by gastric lavage, of food residue and gas accumulation is the next most important pre-operative measure.

In the post-operative management the maintenance of the body temperature is, as before, of the utmost importance. The infant is wrapped in a warm blanket or cotton jacket and the bed is well equipped with hot water bottles.

For the first hour or two, the head of the bed should be lowered. After nourishment has been commenced, the head of the bed may be raised and from this time on the infant is kept in a semi-erect position. This elevation assists in emptying the stomach, especially in gastro-enterostomy cases, and, at the same time, permits the escape of gas through the mouth.

The use of excessive hypodermic stimulation after operation is to be deprecated; only one measure, namely, hypodermoclysis of normal saline or of glucose solution, is always indicated and this may be safely used as a routine practice. Of the other stimulants, epinephrin, subcutaneously, is the most satisfactory because of the rapidity of its action. Caffein and atropine, hypodermatically, are sometimes valuable, and by mouth dilute whiskey or brandy. The value of blood transfusion as a stimulant is very questionable.

A post-operative rise in temperature is to be expected in nearly all cases. No antipyretic measures are needed for this reactionary temperature, except that care should be taken not to use excessive artificial heat. A pyrexia that persists for more than three days, or one that unexpectedly occurs after the first reactionary fever has subsided, should be investigated as it usually indicates some complication.

Feeding is the most important feature of the post-operative care of infants; a slight error in judgment may precipitate a gastro-intestinal upset that is very difficult to control. It is impossible to feed all children by the same set rule, but a general routine is of value and is applicable to the majority of cases. The aim should be, as soon as possible after operation, to start nourishment in a concentrated and readily digestible form. For this purpose there is no food that can take the place of breast milk and



every effort should be made to procure enough to tide the patient over the first week at least.

An hour after operation, providing the recovery from the anæsthetic has been complete, the patient is given 16 ccm. of water, and an hour later 12 ccm. of breast milk mixed with 4 ccm. of water. It may be necessary at first to use a medicine-dropper for the administration. The breast milk is repeated every three hours, eight feedings a day, and is alternated with the water. Both are gradually increased so that twenty-four hours after operation 16 to 24 ccm. of undiluted breast milk is being given every three hours and a similar amount of water between feedings. At the end of forty-eight hours the child is usually taking 20 to 30 ccm. and at the end of seventy-two hours 30 to 45 ccm. at a feeding. The administration of water by mouth during the first three or four days is of the greatest importance. The time required to increase the quantity of milk to meet the caloric requirements of the child has been on an average five days; in small babies three days may be sufficient and in the well-nourished as much as eight to ten days.

It is wise not to defer putting the baby to the breast longer than one week after operation or when the feeding from the bottle has been increased to about 60 ccm. This is usually on the sixth or seventh day. The nursing must be carefully supervised for the next week, the amount taken at each time being measured by weighing the baby before and after. If the quantities obtained are too small, the nursing may be supplemented by a modified milk mixture.

In well-nourished children a sponge bath may be given every day until the abdominal wound is completely healed and the dressing discarded. In poorly nourished or emaciated infants, an oil rub is to be preferred.

Vomiting, although it is to be expected in a certain degree in a large proportion of the patients after operation, is frequent and troublesome in some cases. The more common exciting causes of vomiting are:

1. Distention due to accumulation of gas either in the stomach or in the intestines.
2. Defects in the operation, such as faulty adjustment of the jejunum and stomach, or incomplete severance of the constricting muscle-fibers by the plastic operation.
3. A too rapid increase of the feeding.
4. The occurrence of complications, especially general peritonitis. Of these causes distention due to gas accumulation is by far the most frequent. If it is mainly intestinal, a colon irrigation, repeated as often as necessary, is all that is required for relief. When the accumulation is in the stomach, the head of the bed should be elevated and the child frequently raised to the upright position to allow the free escape of the gas. In patients who do not respond to these measures, it is well to pass a soft rubber catheter into the stomach before each feeding. Lavage may be employed if the vomiting is persis-

tent, but its use in the first two or three days after the operation of gastro-enterostomy entails not a little risk.

Repeated fæcal evacuations are usually not seen during the first twenty-four hours. At the end of this period, therefore, it is well to give a teaspoonful of castor oil to stimulate peristalsis and remove mucus and gas. The first few stools are usually loose and green in color (or meconium-like if there has been any bleeding into the stomach). Normal breast milk stools are not seen, as a rule, until the fourth day after operation. A too rapid increase in food, especially in children who have been vomiting for several weeks prior to operation, is very apt to produce loose, frequent stools. The measures usually employed for the relief of acute intestinal disturbances are applicable to this condition.

The dressing at operation should consist of a narrow fold of sterile gauze which just covers the incision and is held in place by adhesive strapping; there is seldom any indication to disturb it for the next four or five days. A binder should not be used. The advantage in using a small dressing is that the least hæmorrhage can be readily detected and controlled. The stitches may be removed on the sixth to the eleventh day, depending on the condition of the wound, and after that a protective pad of gauze is all that is required.

Of the 36 infants discharged in good condition, 4 died from a variety of causes, none of which were directly associated with the operation. The deaths occurred two weeks after discharge in two instances and two months after discharge in the others. Two children were lost sight of, and of the remainder 10 were followed for one or two years after discharge, 13 for six months to one year, and 7 for less than six months.

EDWARD L. CORNELL.

**Bradford, W. H.: Chronic Gastric and Duodenal Ulcer. *J. Maine M. Ass.*, 1916, vi, 232.**

The results obtained from surgical treatment of patients suffering from chronic gastric and duodenal ulcer have been among the most satisfactory in all the author's surgical experience. The mortality has been exceedingly low. A man with acute perforation of a chronic gastric ulcer died one week after operation. With this exception, no deaths have followed surgical treatment.

Among his successful cases, the following may be briefly mentioned:

A male, aged 30, was operated on eight years ago for a large palpable mass diagnosed as gastric cancer, and is now perfectly well.

A male, aged 57, had been suffering from gastric ulcer for seven years. In May, 1914, he had the pyloric half of his stomach removed and has gained 55 pounds since operation.

A male, aged about 60, had been taking medicine for stomach trouble for thirty years; he was emaciated and anæmic. He was operated on for duodenal ulcer in November, 1914. After operation his

improvement was wonderful and he had no further need of medicine.

EDWARD L. CORNELL.

**Mills, R. W.: Observations on Duodenal Ulcer with Special Reference to Its X-Ray Diagnosis.** *Interst. M. J.*, 1916, xxiii, 68.

The stomach in uncomplicated duodenal ulcer is generally considered to be characteristically hypertonic. Hypertonic stomachs are characteristic of those of asthenic habitus; consequently either the stomach in duodenal ulcer becomes abnormally tonic, or duodenal ulcer occurs in those who naturally have hypertonic stomachs. Mills thinks an investigation will suggest that both are true. Should certain complicating factors exist, the gastric hypertonus of duodenal ulcer is lost to a degree commensurate with that of the complicating factor. Such factors are duodenal stenosis resulting from ulcer, and general conditions causing atony, such as general debility from hæmorrhage and the like.

In uncomplicated duodenal ulcer there is a well-known increased initial motility, i.e., early and free pyloric outflow. With stenosis motility is retarded and there may be a six-hour retention. Cap deformity is by far the most valuable and constant diagnostic indication of duodenal ulcer. Callous ulcer situated in the first part of the duodenum is impossible without characteristic and persistent anomaly as to the form of the cap, and is at times added to by spasm. A perfect cap means no callous ulcer. Deformity may also occur as the result of adhesions not due to ulcer. The contention that small ulcers can exist without cap deformity is in dire need of illumination through illustrated specific case reports. Certain peculiarities of gastric peristalsis occur in uncomplicated duodenal ulcer, which were not anticipated before the advent of the X-ray. We have heretofore known of but one clinical condition resulting in visceral hyperperistalsis, namely, stenosis.

In uncomplicated duodenal ulcer, gastric hyperperistalsis occurs immediately or shortly after the ingestion of the contrast meal, not only without stenosis distal to it, but with a decrease in the resistance normally offered by the tonus of the pyloric sphincter. Mills thinks that all indications are unfavorable to the idea that the pain of duodenal ulcer is due to hypertension in either stomach or cap, the so-called adequate stimulus of visceral pain, but that it is due rather to the nerve-endings in the ulcer-floor becoming actually and abnormally sensitive to excess of hydrochloric acid.

ALBERT MILLER.

**Woolsey, G.: The Surgical Treatment of Gastric and Duodenal Ulcers.** *Med. Rec.*, 1916, lxxxix, 592.

Woolsey advises a thorough trial of medical treatment for gastric and duodenal ulcers, and states that acute ulcers will almost all yield to it, only cases of perforation requiring surgical treatment. The symptoms due to chronic ulcer will in time subside

with or without treatment. But relapse is the rule and there is some question whether medical treatment gives a permanent cure.

After two or more relapses have occurred surgery should be resorted to. Gastro-enterostomy is the operation of choice. It affects both the drainage and the chemistry of the stomach: the acidity is diminished by the presence of a small quantity of bile and pancreatic secretion; the pylorospasm is relieved and the stomach empties itself without irritation of the ulcer by the passage of food. Healing occurs in 82 per cent of cases (Paterson). Symptoms will persist if due to adhesions or malignant degeneration. Gastro-enterostomy is not a certain preventive of perforation or hæmorrhage, but it diminishes the probability of their occurrence. On account of the anatomical structure of the duodenum, ulcers of the anterior duodenal wall can be overlooked and search should also be made for the not infrequent contact ulcer on the posterior wall, which is more indurated and of the gastric type. Cases where the pylorus is stenosed give the best late results.

The various methods of operation are: (1) Von Eiselsberg's, the most radical, in which the stomach is divided proximal to the ulcer and both ends sutured; (2) Wilm's, in which a band of fascia half an inch wide is fastened tightly around the stomach proximal to the ulcer; and (3) the method of infolding the pyloric end by suture.

Since duodenal ulcer almost never undergoes malignant degeneration, gastro-enterostomy with or without pyloric exclusion gives excellent results. It is different in callous gastric ulcers, which not infrequently become malignant. It is sometimes impossible to differentiate between an indurated ulcer and a carcinoma. A radical removal of the chronic ulcer is best in such cases.

The two complications of gastro-enterostomy, vicious circle and peptic jejunal ulcer, usually of the stoma, are avoided by proper technique. The author uses fine chromic gut for both suture layers.

The more radical operations for gastric ulcer are: excision, pyloric resection, and mesogastric resection. Excision is not a satisfactory operation. Resection is more radical but gives better results.

In ulcers of the pyloric region of the stomach, the Billroth method is the operation of choice; it should be followed by gastro-enterostomy, or the Pylor-Reichel modification in which the proximal end of the stomach is sutured directly to the jejunum. The chief technical difficulties are due to adhesions, especially in case of a penetrating ulcer. When the ulcer is farther from the pylorus, usually on the lesser curvature, the mesogastric resection, or resection in continuity is the operation of choice. The mortality of resection is greater than that of gastro-enterostomy, but the operation is well borne and the mortality not high. In all cases of gastric or duodenal ulcer the patient should be put on a special diet for some time after operation.

The so-called hour-glass stomach which results



from a cicatricial contraction of a gastric ulcer is treated on the same principle as callous ulcers.

The two complications of gastric and duodenal ulcers are hæmorrhage and perforation. Sudden acute hæmorrhage is usually due to acute ulcer and is best treated medically. In recurring hæmorrhages with threatened severe anæmia, operation should be done before the anæmia progresses. In cases of dangerous hæmorrhages direct transfusion of blood is of great value. In acute perforation early diagnosis and immediate operation are most essential.

Subacute and chronic perforations result in perigastric and subphrenic abscesses, which demand accurate diagnosis to indicate the operation suitable to the case.

L. R. GOLDSMITH.

**Haines, W. D.: Some Features in the Management of Surgical Disorders of Digestion.** *Lancet-Clin.*, 1916, cxv, 352.

The newer pathology has shown that the organisms of an infection occurring in the buccal cavity, the tonsils, or elsewhere, may be transmitted by the lymph or blood stream to remote parts of the body, there to form new foci when arrested in the terminal vessels of such organs as the gall-bladder, stomach, duodenum, brain, or kidney. According to these newer concepts, digestive disorders, gastric ulcer, cholecystitis, and appendicitis are to be regarded as terminal infections. Gastric and duodenal ulcer must be regarded not as a disease but as the end-result of a disease. To successfully cope with the symptoms the original source of infection must be removed. Pus must not remain unchallenged anywhere in the system.

The author is convinced that 70 per cent of digestive disorders may be cured by removal of some extragastric pathological condition, the source of the disorder being an overloaded colon, infection of the pancreas, gall-bladder, gums, sinuses, or tonsils.

The mortality following perforation of an ulcer increases by leaps and bounds after the first few hours, and immediate operation is imperative. The thick indurated mass associated with chronic prepyloric ulcer should be removed, but these patients are in such poor condition from prolonged starvation that they are poor surgical risks and the better practice is to do a two-stage operation: a primary gastrojejunostomy and a secondary resection after recovery from starvation. Occasionally one finds that the mass at the pylorus has entirely disappeared. In this case the second operation terminates as an exploration.

Hæmorrhage is a symptom difficult to relieve. Calcium chloride and horse serum may tide the patient over until an interval operation may be done. The discrepancy between the size of the ulcer and the amount of blood lost may be great. Perigastric adhesions are prone to undergo contraction with the production of obstructive disturbances in the stomach. When firm it is better to provide ample drainage for the stomach in preference

to making extensive lacerations with the subsequent production of new adhesions. In the vast majority of instances separation of adhesions is but temporizing and permanent benefit may not be expected.

The author's experience with cancer of the stomach has been discouraging, but surgery is the only means by which life may be prolonged. It has been said that gastrojejunostomy tends to prevent the subsequent development of malignancy, but several cases are mentioned in which resection for perforation of a clinically benign ulcer was followed by cancer within the following fifteen months.

One-third of all cancers occurring in man are located in the stomach and the vast majority originate in the margin of an unhealed gastric ulcer. He who recognizes this and deals radically with the ulcer before malignancy has begun will add much to the sum total of human life and happiness.

E. K. ARMSTRONG.

**Chislett, H.: Intestinal Adhesions.** *Clinique*, Chicago, 1916, xxxvii, 152.

From the viewpoint of causation, the author's experience would seem to indicate the order of frequency to be:

1. Former attacks of inflammation of some intra-abdominal organ.
2. Injudicious manipulation and lack of tenderness in necessary handling of the intestines and other intraperitoneal organs during previous operations.
3. Traumatism through contusions or wounds of the abdomen, including the too forceful reduction of herniæ, the improper application of truss pressure, and the injection treatment for herniæ.
4. The use of drainage after operations, either capillary or tubular.
5. Imperfect wound healing with resulting ventral hernia.
6. Idiosyncrasy—some patients seeming predisposed to the formation of adhesions even upon the most gentle manipulation.

The prevention of adhesions following operations upon abdominal organs depends upon the following factors:

1. Gentleness of manipulation in all necessary handling of tissues.
2. The avoidance of unnecessary exploration by more careful case taking and more accurate diagnosis.
3. The free exposure of the field by sufficiently large incisions, and especially by posture, to minimize the necessity of blind and blunt separation of adhesions.
4. The use of moist rather than dry packs, except when their retention may be demanded for protection.
5. The avoidance of drainage where possible.
6. The covering of all denuded areas.
7. The use of normal salt solution poured into the peritoneal cavity after completion of operation.

8. The early establishment of and continuance of peristalsis.

9. The assumption of a posture favoring the prevention of contact with sutures or ligated parts.

10. The frequent change in position of the patient.

11. The suture of the peritoneal wound with edges.

12. The covering of all denuded areas not amenable to suture with omental grafts.

13. The use of sterile omental oil rather than the normal salt solution where denudations cannot be properly covered.

EDWARD L. CORNELL.

**Fraser, J.: Enteric Intussusception.** *Edinb. M. J.* 1916, xvi, 275.

Two cases are briefly reported in which intussusception occurred above the ileocecal valve, complete recovery following operation.

In both, the symptoms were greatly similar, showing early colic-like abdominal pain, slight nausea, increasing constipation, rising temperature and pulse-rate, with abdominal distention and rigidity. In neither was the presence of blood per rectum noticed, and general prostration occurred early. The age of the first was three and one half years; that of the second ten years.

In the first case the intussusception was found about ten inches above the ileocecal valve. This then was invaginated into the large bowel, the ileocecal valve remaining at its apex. In the second case, the intussusception involved about twenty inches of ileum, extending to within twelve inches of the ileocecal valve.

In both cases resection of the involved ileum was performed, followed by end-to-end anastomosis. In the first case recovery was complicated by acute parotitis and later by a condition resembling poliomyelitis; recovery however occurred. In the second, uneventful recovery took place.

The author emphasizes the age, the gradual onset, and the absence of blood per rectum. The latter is almost diagnostic of enteric intussusception.

P. M. CHASE.

**Johnson, J. E.: Conclusions in the Study of Intestinal Stasis.** *South M. J.*, 1916, ix, 342.

The author traces his experience with cases of intestinal stasis, beginning at the stage where the appendix alone was removed to what he terms the "blackest page of disappointment" in this endeavor, the mechanical correction of the various ptoses and kinks discovered in this condition. Finally comes the physiologic stage, which offers most hope for the proper understanding of this condition.

There are three sphincters in the gastro-intestinal tract: the pylorus, the ileocecal valve, and the anal sphincter. The function of the pylorus is to hold food in the stomach a proper length of time — 4.5 hours — for its preparation for intestinal digestion. If held longer by obstruction or spasm of the pylorus it becomes putrefied and the intestine consequently

absorbs bad food. The cæcum is the cesspool of the intestinal tract. If the ileocecal valve be incompetent, there is regurgitation and the patient literally feeds on his own excreta.

The author points out the effect of irritation on one of the sphincters in its relation to spasms of the sphincter higher up. The most common example is pylorospasm due to chronic appendicitis. This condition will cause a "delay toxæmia," the points of diagnosis of which are repeated soreness in the right side preceded by toxic headaches without colic. In advanced cases of this type there is a thickened terminal ileum and a distorted, infected colon; a right-sided colectomy is the only remedy of avail in such cases.

The toxæmia of ileocecal regurgitation is quite different from the toxæmia of delay. The former is the cause of visceroptosis (through toxic paralysis of the splanchnic nerves) and the formation of inflammatory membranes due to bacterial invasion of the walls of the intestine. The cure for ileocecal regurgitation is a plastic operation described by the author in a previous paper for the re-establishment of the function of the ileocecal valve. E. FISCHER.

**Hubeny, M. J.: Roentgen Examination of the Appendix.** *Illinois M. J.*, 1916, xxix, 109.

Röntgen examination has eliminated some of the possible errors in the diagnosis of chronic appendicitis. Hubeny gives some of the confirmatory data which with the clinical findings warrant this diagnosis.

The fluoroscopic examination is the most satisfactory, and visualization of the appendix is preferably made by opaque meal.

It is necessary that the appendical lumen be patent, otherwise the appendix may not be demonstrable.

Some observers think that every appendix which permits the entrance of an opaque meal is pathologic; however, if the appendix empties itself at the same time as the cæcum it must not be so considered.

Adhesions are considered as pathological evidence of previous inflammations. These may be fluoroscopically recognized, particularly if extensive; contractions due to stricture of the lumen and other results of a diseased condition can also be demonstrated. Much information may be derived from the size and other conditions of the visualized appendix.

Since it is well known that aside from gastric ulcer chronic appendicitis is the most frequent cause of spasmodic hour-glass constriction of the stomach, this, as well as other effects on remote organs, may be looked for.

HOLLIS E. POTTER.

**Morris, R. T.: Fibroid Degeneration of the Appendix.** *J. M. Soc. N. J.*, 1916, xiii, 120.

Among four well-defined types of appendicitis, fibroid degeneration appears to furnish the commonest lesion. It is an irritative lesion, not infective.

Individuals of the asthenic group presenting a



number of stigmata of decline appear to have fibroid degeneration of the appendix more frequently than do other individuals of normal development. Patients with enteroptosis and with the features of arrested development belonging to visceroptosis are prone to include symptoms of fibroid degeneration of the appendix, along with their other symptoms.

The signs which belong to fibroid degeneration of the appendix, the irritative lesion, the commonest form of appendix trouble, are:

1. Transitory pain and discomfort in the appendiceal region, not sufficiently severe to send the patient to bed, and extending over many years.

2. Hypersensitiveness of the right group of lumbar ganglia, determined by making deep pressure upon the abdominal wall about an inch and a half to the right of the navel and a little below that point, not accompanied by similar sensitiveness of the left group of lumbar ganglia.

3. Habitual distention of the ascending colon with gas.

4. Various gastro-enteric disturbances partly due to irritative influences from the appendix, and partly due to other features of neurasthenic habit or arrested development, such as sagging colon, loose kidney, and complications previously alluded to.

EDWARD L. CORNELL.

**Dubose, F. G.: Neglected Appendicitis; Its High Mortality a Diagnostic and Therapeutic Responsibility.** *South. M. J.*, 1916, ix, 332.

The unduly high death-rate from appendicitis, given in reports of insurance companies, as compared to the exceedingly low mortality from early operation in acute appendicitis makes it incumbent upon the physician to enlighten the laity upon the possible seriousness of what appears to be a "bellyache."

Under the title pathology, the author accepts and quotes freely from the report of Stanton. All cases represent merely different stages or degrees of inflammation. The second day is considered the most serious and Dubose says: "If it is going to occur at all, gross perforation of the appendix itself, with or without gangrene, usually takes place before the end of the second day." Attention is called to the conclusion Stanton reached denying the existence of catarrhal appendicitis as a pathological entity and affirming that bacteriological perforation occurs during the first few hours of the attack whether or not gross perforation of gangrene is present. Moynihan and Deaver are freely quoted in pointing to the direct connection between perforation and spreading peritonitis and pergaetion.

Under the heading symptomatology, after describing the usual well known symptoms and signs, the author states that the differential diagnosis lies not between acute appendicitis and acute indigestion, but between appendicitis and some other condition demanding surgical interference. It is only the neglected cases which demand most careful judgment as to when is the best time to operate.

In coming to a decision the surgeon must always bear in mind that what has been done before he has been called and what can be done post-operatively have as much bearing on the ultimate outcome of the case as the operation itself. If a late operation is unavoidable, the author advises that the stomach be emptied and kept empty; that the large bowel be cleansed with enemata and be prepared for the use of proctoclysis; that morphine in sufficient quantities be given "to relieve pain, lessen peristalsis, diminish shock, retard absorption, limit tissue waste, and to favor the formation of protective peritoneal adhesions"; that the patient be put in Fowler's position and that proctoclysis of 15 per cent glucose, 1 per cent sodium bicarbonate, and 0.5 per cent sodium chloride be given. If operative delay be unavoidable the author gives in full his reasons for never administering a purgative, for withholding all nourishment by mouth, and for the administration of morphine.

In case more than forty-eight hours have elapsed between the onset and the time when the surgeon is called immediate operation is imperative (1) if all unfavorable symptoms become exacerbated in spite of the starvation-rest treatment; (2) if there be sudden relief of pain with subjective betterment but with a quickened pulse-rate indicating rupture of the appendix or of an abscess or of thrombosis; (3) if a circumscribed swelling appears in the right abdomen (evidence of localization of inflammatory process by adhesions); (4) if the previously high leucocyte count falls suddenly or gradually declines with a steady increase in the polymorphonuclears; (5) when more than one week has elapsed since the onset.

Operation should be deferred from the third to the seventh day after onset, long enough to give the starvation-rest treatment a chance, and should be deferred as long as the patient shows improvement under this treatment; in the presence of a blood-count which shows a high polymorphonuclear count without a corresponding leucocytosis, which is indicative of intense infection or of a patient with low resistance so overwhelmed that a fatal outcome is to be expected under any treatment. The benefits derived from delay are the recovery of the sympathetic nervous system from shock; the blood is given time to form antibodies and the peritoneum is allowed to form limiting adhesions. The dangers in postponing operation are: further saturation of the system with toxins, especially in the presence of a gangrenous or obstructed gut; bacterial invasion of the blood stream; lymphatic infection with resultant empyema, subphrenic abscess, multiple abscesses of the liver or cholecystitis; progressive suppurative peritonitis.

Of the factors influencing the outcome, rational pre-operative treatment is the most important in favorably influencing the result of operation. The anæsthetic of choice is nitrous-oxide-oxygen, alone or combined with infiltration. The operation should be well planned. The author describes an

incision which he has proved to be very satisfactory. The skin is incised transversely through McBurney's point; the aponeurosis and muscles are divided in the usual way and the peritoneum opened; if more room is required, the fused aponeurosis at the outer border of the rectus is cut and extended downward, thus permitting a triangular flap to be raised and as extensive an exploration as may be desired. Every pus pocket is opened and drained; the appendix is removed in every case where at all feasible, and thrombosed or gangrenous omentum is likewise excised. Sheets of rubber tissue or gauze wicks covered with rubber tissue are used for drains. The author believes that today the errors of appendiceal surgery result largely from timidity or conservatism, due to a lack of understanding of the pathology underlying the picture.

At the close of the operation hypodermoclysis is given supplemented by proctoclysis; the patient is placed in Fowler's position, and morphine in sufficient quantities to relieve pain is administered hyperdermatically. Stomach lavage should be used every four to six hours, and where duodenal contents are regurgitated, the stomach contents obtained by lavage are re-introduced in the proctoclysis. Essence of pepsin, one teaspoonful to a quart of water, is administered per rectum to relieve gas. Pituirrin is used for distention after the third day, when it is first permissible to stimulate peristalsis. Milk and molasses, equal parts, are the safest ingredients for an efficient purgative enema. The routine use of strychnine, caffeine, spartein, nitroglycerine, and strophanthin is condemned. Morphine, atropine, and pituitrin have distinct indications and are valuable when properly used. Glucose and soda administered intravenously make an ideal heart-muscle stimulant, besides affording nutriment and acting as aids to the elimination of toxins. The post-operative care is equally as important as the operation.

E. FISCHER.

**Andries, J. H.: The Choice of Time for Operating in Acute Appendicitis and Gall-Bladder Disease.** *J. Mich. St. M. Soc.*, 1916, xv, 182.

In acute appendicitis early operation is the best and oftentimes the only chance of a cure. If the patient is not seen until the third day or later, it is best to postpone operative treatment until the abscess is circumscribed and localized. The danger to the life of the patient is greatest if operation is performed on the third or fourth day. After the fifth day there is no longer any danger if it is treated simply as an abscess. If pneumonia complicates acute appendicitis the outlook is poor and the condition had best be treated non-surgically until the pneumonia subsides.

Appendicitis during pregnancy is also a very grave condition, the more favorable cases being those that are operated upon during the first few hours of the attack. In every case of appendicitis in the female the physician should satisfy himself as to the

possibility of pregnancy, as such a complication is always a hazard to the patient's life.

In gall-stone disease early operation is contra-indicated only by the presence of some condition in another organ which would constitute a hazard to the patient's life. Early operation is not accompanied by danger providing the patient is otherwise in good condition. Delay means courting advanced pathology and complications. Should infection of the gall-bladder be present operation is contra-indicated if the temperature is above 102°, except in those cases of greatly distended gall-bladder where rupture is imminent. Here all that is necessary is incision and drainage, removal of stones by any method under these circumstances being dangerous.

Thus it is seen that in both affections the choice of time for operation runs parallel, an early operation being necessary to avoid progressive pathology, to lessen the difficulty and seriousness of surgical treatment, and to minimize the danger to the patient's life.

E. K. ARMSTRONG.

**Wiener, J.: Appendectomy Under Local Anæsthesia.** *J. Am. M. Ass.*, 1916, lxvi, 1078.

The technique which the author employs is as follows:

Half an hour before the operation the patient receives a quarter of a grain of morphine hypodermatically. A 1 per cent solution of novocaine is used, to an ounce of which is added 20 drops of 1:1,000 solution of epinephrin. As much as 240 minims of this solution can be safely used for an adult, which would correspond to about 2.5 grains of novocaine. As a matter of fact, the author has never found it necessary to use anything like that amount to do a painless appendectomy.

The muscle-splitting McBurney incision is used in most cases, acute as well as chronic. This incision is particularly adapted to the operation under local anæsthesia. The skin near the anterior superior spine is not very sensitive; but by far the greatest advantage of an incision in this location is the fact that it comes directly down on the cæcum. Rarely is it necessary to pack away the small intestines (although this can readily be done without causing pain), and there is thus less handling of the intestines. The novocaine is first injected into the skin along the line of the proposed incision. In doing this the author tries to blanch the skin with the injected solution. Then the novocaine is injected under the skin along the same line.

After a wait of three minutes, the skin and subcutaneous tissues are painlessly incised down to the aponeurosis of the external oblique. A sharp scalpel is used for dividing all layers, as scissors, being blunter than a knife, are more apt to cause pain. Next novocaine is injected under the external oblique aponeurosis and after two minutes that is divided. The solution is next injected into the internal oblique muscle, parallel to the fibers of the muscle.



After another wait of a few minutes, the internal oblique is cut parallel to its fibers. A little novocaine is then injected under the peritoneum and an interval of fully three minutes is allowed to elapse before dividing it. If done in this way, there will be no pain up to this point. All manipulations should be as gentle as possible. It is rarely necessary to apply artery forceps in opening the abdomen through this incision, which is an additional advantage, as the crushing of the blood-vessel with forceps may cause some pain unless the novocaine is injected around the vessel. If necessary, a packing can be introduced to keep the small intestines out of the way, although it is rarely necessary with this incision.

As soon as the cæcum with the appendix is exposed, some novocaine is injected into the mesenteriolum. If this is not done, the patient will complain of cramplike abdominal pain referred to the navel or pit of the stomach. By anæsthetizing the mesenteriolum, this pain is obviated. After a wait of three minutes, the appendix can be pulled out of the abdomen, the mesentery ligated and divided, and the appendix removed with almost no pain. It is not necessary to inject novocaine into the base of the appendix before ligating and removing it. If the mesenteriolum is properly anæsthetized, there will be no pain during the removal of the appendix. It is perfectly feasible to draw the right tube and ovary into the wound and do any operation on them that may be indicated.

The abdomen is closed layer by layer in the usual manner and, if the technique has been correct, the closure of the wound will be entirely painless.

EDWARD L. CORNELL.

**Landsman, A. A.: Anorectal Fistula.** *N. Y. M. J.*, 1916, ciii, 829.

The author treats anorectal fistula from the standpoint of the anatomy of the pelvis and ischiorectal fossa, and maintains that the condition in practically every case is preceded by a suppurative focus, which in burrowing into the bowel or any viscus, between the layers of the endopelvic fascia, or out on the skin surface, simply follows well-recognized physical laws, and should accordingly be looked for in situations where gravity and diminished resistance of the tissues combine to favor its production. Hence internal openings of fistulæ are met with at the junction of the two sphincters, while external openings, when the abscess ruptures through any portions of the ischiorectal space, have been found in the author's experience, in the posterolateral angle of the fossa.

Abscess of the pelvic or anoperineal region results in fistula primarily because of failure to drain promptly, thoroughly, and efficiently, or because of careless or unskillful after-treatment, or both, favored by natural conditions in this region, which interfere with rest and cleanliness, so necessary in wound repair in other situations.

It is evident from the above that the successful

operative treatment of fistula depends, in a general way, upon the production of favorable surgical conditions, followed by suitable after-care.

**Saphir, J. F.: Ischiorectal Abscess from a Fish Bone.** *N. Y. M. J.*, 1916, ciii, 784.

A man, aged 34, swallowed a fish bone and three days later developed chills and fever. He was operated upon in two weeks for ischiorectal abscess, but the fish bone was not removed. The fistulous tract returned in six weeks. At the second operation the bone was removed by the author.

The points of importance that stand out in the care and treatment of fistula cases are as follows:

1. The necessity for early diagnosis.
2. The necessity for more frequent rectal examinations on the part of the family physician.
3. The necessity for complete and more thorough laying open of the canal and probing the affected area for branch canals, pockets, and foreign bodies.
4. The necessity for trimming off the edges of the wound to prevent bridging and too hasty healing.
5. The necessity for keeping the wound clean and properly drained to prevent infection.
6. The sphincter can be cut without causing incontinence if cut at right angles to the muscular fibers.
7. The ability to get along without locking up the bowels for a week, without the use of opiates, and without the use of the barbarous rubber hose.

EDWARD L. CORNELL.

**Hoeve, H. J.: Complete Removal of the Intestinum Rectum and Colon Pelvinum for Carcinoma.** *Internat. J. Surg.*, 1916, xxix, 35.

The author briefly discusses the subject of carcinoma of the rectum and sigmoid and reports a case of complete removal of these structures. He emphasizes the necessity of a thorough rectal examination in all cases showing lower bowel symptoms.

The theory of Park and Behla that cancer is an infectious disease due to a parasite belonging to the chytridiaceal, i.e., a vegetable organism on the borderland of the vegetable and animal kingdoms, is considered by Hoeve to be the most plausible.

In accordance with the opinions of Lusk, Edebohl, and the Mayos, the author strongly advocates the abdominal route in the removal of the rectum and sigmoid as giving better exposure and a cleaner removal of all the glands and surrounding tissue usually involved. Colostomy is done either in the left iliac region or through the left rectus muscle. Contra-indications for operations are metastases into the liver, involvement of the seminal vesicles, the prostate, or the base of the bladder, the parametrium and the ovaries in the female, and poor arterial development of superior hæmorrhoidal and inferior sigmoidal arteries.

The case reported is that of a male, colored, age 46, complaining of excruciating pelvic pains, paroxysmal in character, loss of weight, weakness, and general debility. On examination, total occlusion of

the rectum was found, extending upward from the prostate for about five inches. The mass was hard and bled easily. No enlarged glands were palpated.

Median abdominal section was performed, but no liver metastases and no glandular involvement were found, the growth being entirely extraperitoneal. The bowel was severed well above the mass, sterilized by phenol and alcohol, and closed by purse-string sutures. The rectum was freed by blunt dissection and the perirectal tissue completely removed. The rectum was then cut at the internal sphincter which was touched with phenol and alcohol. The cavity was drained through the anus by a large rubber tube; a small tube was inserted through an opening posterolateral to the anus and a few strips of iodoform gauze inserted, after which the abdomen was closed.

On the third day bacillus coli infection developed which was checked by irrigation through the anal tube, but the patient died on the eighth day. No post-mortem was obtained.

The pathological diagnosis was adenocarcinoma of the rectum. P. M. CHASE.

**Morley, A. S.: The Treatment of Hæmorrhoids by Injection.** *Lancet*, Lond., 1916, cxc, 617.

The obvious advantages of the treatment are: (1) that the patient need not be confined to bed for more than 24 hours, at most; (2) that there is no need for general or local anæsthesia since the treatment is practically painless, if properly performed; (3) that it can be made quite inexpensive, so much so that it may be brought within the reach of even a poor patient who certainly could not face the expense of an operation in a hospital; (4) that it is a perfectly safe procedure in such patients as the very aged, pregnant women, and others, who for some reason cannot take an anæsthetic safely, such as persons with dangerous heart or lung diseases; (5) that there is no after-pain; and (6) that it is invariably harmless.

The treatment is not suited to cases of strangulated or irreducible hæmorrhoids nor to cases in which there are other complicating conditions, such as old-standing fissures, fistulæ, ulcers, etc.

The treatment consists of the injection into each internal pile of a few drops of carbolic acid and glycerine. The following solution is employed:

Acid, carbolic. . . . . gr. xlviii  
Glycerine. . . . . dr. ii  
Aque destillat. . . . . dr. ii

The amount which should be injected into each pile varies from 2 to 6 minims of this solution. Inject all the piles at one sitting whenever it is possible to do so. It is easiest and best in every way to perform the injection through a large speculum. The one most suitable is Kelly's sphincteroscope. The other needful appliance is a suitable syringe.

Before making the injection, the piles may be sponged over with a little weak biniodide of mercury or 1/50 lysol solution, which should be mopped up

at once with a dry swab to prevent risk of absorption. It is a good plan also to touch each pile at the spot where it is proposed to inject it with a drop of pure carbolic.

The patient should be instructed to keep quiet, in bed if possible, for the first 12 to 24 hours, and to wash the piles at once with cold water should they prolapse and then to grease them well with vaseline or some simple ointment and gently press them back. Where the piles are large, as many as four or five injections at weekly intervals may be required, but, as a rule, two or three are sufficient.

EDWARD L. CORNELL.

**Edwards, F. W.: The Treatment of Hæmorrhoids by Injection.** *Lancet*, Lond., 1916, cxc, 819.

The author refers to the fact that Van Buren was one of the first to advise the treatment of hæmorrhoids by injection. He has tried out the method in some hundred cases and seems well satisfied with the results. Except in two cases there was no pain. One injection sufficed to cure some, but the majority required two or three. It failed in one or two cases, which later required excision and ligation. He uses 20 per cent carbolic acid in equal parts of glycerine and water. Having protruded the piles, the patient is placed in the knee-elbow position and an injection of from 3 to 6 minims of the carbolic solution is made into the center of each pile. In some of the larger piles he injects 5 minims in two places. The piles are then well smeared with vaseline and replaced as soon as possible, for the injection always causes the hæmorrhoids to swell. Bowel movements are prevented for forty-eight hours, and should prolapse occur in the meantime, immediate replacement is necessary.

He emphasizes the importance of protruding the piles before attempting the injection and gives as his reason the following: (1) It is much easier and one is more certain of getting into the center of each pile. (2) If the piles are injected through a speculum a special long syringe is necessary, whereas an ordinary hypodermic syringe suffices when the piles are prolapsed. (3) Piles which cannot be protruded should be left alone. They are to be cured by palliative means, such as local applications, enemata, attention to diet, regulation of the bowels, etc. (4) An assistant is almost a necessity if a speculum is used, and should any bleeding occur on the withdrawal of the needle, is indispensable. He does not believe that this is as likely to take place as when the piles are prolapsed, but it might occur, when an extra pair of hands would be useful.

Cases fitted for injection are those of uncomplicated internal hæmorrhoids which can be protruded, then returned and kept within the bowel, so that comparatively few cases are fitted for the injection treatment. For instance, he cites 11 cases in a day's experience in his clinic in which 10 were complicated by other lesions: 4 with fissure, 4 with external piles, 1 with an anal ulcer, and 1 with a thrombosed internal pile. After the injection a few hours



in bed are advisable, after which the patient can walk about and attend to his usual occupation.

The great advantages Edwards sees in the injection treatment are: (1) no confinement to bed excepting for a few hours when possible; (2) no anæsthetic is needed, therefore, there is no post-anæsthetic vomiting; (3) no pain; (4) no enforced absence from business; (5) no risk from the little operation itself and no risk of stricture or incontinence following; and (6) immediate and steadily increasing betterment.

As regards operative treatment, he is a strong advocate of the ligature operation and condemns the Whitehead operation. DONALD C. BALFOUR.

**Burrows, W. F., and Burrows, E. C.: A New Hæmorrhoidal Operation: the Snare and Bullet.** *J. Am. M. Ass.*, 1916, lxi, 871.

The hæmorrhoidal operation described is simple, rapid, free from danger, suitable for the use of local anæsthesia, and has been used in a series of 60 cases.

The instruments required are a hypodermic syringe and local anæsthetic, half a dozen artery forceps, two pairs of scissors—one pair for cutting the wire, four or five strands of strong pliable wire—both ends of each strand threaded through a perforated lead bullet, and a bullet holder and crusher. The operation resembles most the ligature method, but is cleaner, more thorough, and more quickly carried out than the latter. The pile can be cut away closer to the snare than to the ligature and the snare and bullet finally lie at a higher level than does the ligature which the fingers must get into the anal canal to tie, a procedure that is difficult.

The tissues to be removed are thoroughly anæsthetized with the local anæsthetic fluid, and an incision is made below and to either side of the extro-internal hæmorrhoid, extending into the rectum and dividing the deeper tissues in somewhat the form of a V-wedge. A pair of forceps, previously applied to the tissues to be removed, is used to exert gentle traction on the parts, exposing more of the rectal mucosa proper. A second pair of forceps is placed on the rectal mucosa and again traction is made on the mass and the lateral incisions are extended inward to the degree desired. Above the last pair of forceps a transverse incision is made in the mucous membrane, a point of some importance since it is in this slit that the wire will sink and prevent slipping. A wire loop threaded through the perforated bullet, and its free ends held in a clamp, is then slipped over the handles of the forceps attached to the hæmorrhoid and the loop placed in position with the forefinger. While the wire loop is kept taut, the bullet is grasped by the bullet holder and crusher and forced down on the mucosa to either the skin or mucosa side of the pedicle (preferably the latter), thus tightening the snare. The bullet forceps are closed with pressure and the lead bullet made to collapse on and hold the taut wires where they pass through it, securing the snare in proper

position. The excess of the pedicle is cut away and the wires are severed flush with the bullet.

When extensive prolapse of the rectal mucosa accompanies the hæmorrhoids, the technique is somewhat changed. The "pile" mass is freed in the same manner, but the wire, threaded on a curved needle, passes first transversely through the rectal mucosa above the corresponding hæmorrhoidal area. One half of the wire is already threaded through a perforated bullet; the other then encircles the "pile" pedicle and passes through the same bullet. The mucosa is incised superficially so that the wire will become embedded when tightened, and the hæmorrhoid is cut away. Others present are removed in the same manner, usually three in all, and a small gauze drain is placed in the rectum.

Most of these patients are operated on in the office; but if coming from a distance, or if the condition is complicated with bowel prolapse, they remain in the hospital from 24 to 36 hours.

It is not necessary to pack the rectum or to insert plugs, which cause discomfort while in place and pain on removal. Sutures are not used, but healing takes place by granulation and secondary union. Repair is complete in from two to three weeks. The snare and bullet may come off the fourth day, but usually the fifth or sixth.

EDWARD L. CORNELL.

**Bell, F. M.: Bloodless Operation for Hæmorrhoids and Prolapsus Ani.** *Brit. M. J.*, 1916, i, 415.

The following operation is designed for use in any case in which the Whitehead operation is indicated. After dilatation a silk suture is passed at the junction of the skin and mucosa in the mid-perineal line and one on either side, so that when traction is made the extruded mucosa assumes a triangular shape. Each side of the triangle is then successively clamped, the furrow left after removal of the clamp marking the area for suture. This latter is placed at the apex of the triangle, using silk with a Hagedorn needle at both ends, and then continued as a cobbler's stitch to the lower end of the triangle where it is tied. The redundant tissue is then cut away and the fresh edges lightly touched with the cautery. The other two sides are similarly treated and the traction sutures are removed. This operation has the advantage of being almost bloodless and less liable to complications. E. K. ARMSTRONG.

#### LIVER, PANCREAS, AND SPLEEN

**Deaver, J. B.: Operation for Removing the Gall-Bladder.** *Ann. Surg.*, Phila., 1916, lxi, 415.

The type of operation which the author employs is described as follows: With the abdomen opened, the gall-bladder and right free border of the gastro-hepatic omentum are freed. In case there are adhesions, the region is thoroughly walled off. The edge of the liver and the fundus of the gall-bladder are grasped with the left hand, carrying a

piece of moist gauze, and are pulled downward, outward, and then upward, making the cystic duct and the free border of the gastrohepatic omentum taut. A small incision is made through the upper part of the border of this omentum and the duct exposed. It may now be clamped at its junction with the gall-bladder, and cut across distal to the clamp with the cautery. The common duct can readily be explored by passing a probe through the stump of the cystic duct into the duodenum. Before the probe is removed, the duct is palpated between the fingers and thumb of the free hand, so that no stone is overlooked. The cystic artery lying above and to the inner side of the cystic duct is next clamped and cut. If it is not necessary to drain the common duct, the stump of the cystic is ligated and next the cystic artery.

The gall-bladder is freed from below upward. This is done step by step following closely with a continuous suture of catgut which passes through the liver tissue forming the sides and floor of the gall-bladder bed. In this way, the operation is a bloodless one and the author regards it as superior to packing with gauze or to placing a cigarette drain in the cavity left behind. The divided layers of the gastrohepatic omentum are sutured, not covering in the stump of the cystic duct. A small rubber tube is placed just beyond the free border of the gastrohepatic omentum, and is left for four or five days. Should the stump of the cystic duct leak bile, this tube may be left in place longer.

GATEWOOD.

**O'Brien, F. W.: The Present Status of Gall-Stone Diagnosis by the Roentgen Ray.** *Boston M. & S. J.*, 1916, clxxiv, 309.

O'Brien reviews the literature, paying particular attention to the works of George and Cole. In his own work O'Brien uses a fast, finely-grained, intensifying screen in all gall-bladder work. The advantage of employing screens is that of time as well as intensification. It is fundamental in this work that the patient should not breathe during the exposure. Stout individuals may find it difficult to hold the breath even for a second, hence the reason for speed. The screen, too, will catch more surely the markings of the so-called soft gall-stones. It is again of special value in the robust and corpulent where a long exposure on an unscreened plate would give rise to so much secondary radiation that the gall-stone shadows would actually be lost in the fog.

The position of the tube will depend upon the position and size of the patient but usually it is in a plane parallel to that of the patient's body. A small diaphragm and a small cone are very important factors in the successful search for gall-stones.

One objection to the diaphragm and small cone is the liability to overlook stones in an abnormally placed gall-bladder so that it is well not to confine the search for stones to the commonly accepted location for them. They may be found anywhere

in the lower or upper right quadrant and even to the left of the median line.

The importance of using a satisfactory developer need not be mentioned. More than that, one may with advantage overdevelop certain plates while giving others their normal developing time. Plates that are too dense to be read may be reduced and in that way gall-stone shadows may be detected in the process of reduction that would not be likely to be found in any other way.

The plates should be read only when thoroughly dry. Direct illumination by the northern sky is often particularly helpful.

That experience is a tremendous asset to successful diagnosis is attested by the number of roentgenologists who, under the impetus of the recent advances in gall-stone diagnosis, have gone back over their old plates of the gastro-intestinal tract and gall-bladder region in which they have reported no evidence of gall-bladder calculi, only to find on restudy very definite evidence. DAVID R. BOWEN.

**Petersen, W., Jobling, J. W., and Eggstein, A. A.: Serum Changes and the Cause of Death in Experimental Pancreatitis; Studies on Ferment Action.** *J. Exp. Med.*, 1916, xxiii, 491.

Incidental to a study of the ferment balance of the serum during various pathological conditions the authors had occasion to observe the serum changes in a series of eighteen dogs in which an acute experimental pancreatitis had been produced.

From the series of experiments the authors believe they are justified in assuming that death was caused by the sudden flooding of the blood stream with the higher split products formed at the expense of the pancreatic tissue, of which the proteose increase was an index. Except in the experiments in which they used trypsin for injection there was no increase in serum protease at any time, as would have been expected if the intoxication had been a true trypsin shock, nor was there much change in serum lipase (esterase), the condition in this respect resembling closely the results observed following the injection of protein split products. From this study the following summary is given:

1. The serum changes observed during acute experimental pancreatitis indicate that the shock and death are due to an intoxication from protein split products, and not to an intoxication from pure tryptic ferment.

2. When the pancreatitis is produced by the injection of an antiproteolytic substance (sodium oleate), the degree of intoxication bears no relation to the degree of tissue destruction.

3. The increase in serum antiferment apparently favors the recovery.

GEORGE E. BEILBY.

**Levy, I. H., and Kantor, J. L.: The Incidence of Visceroptosis.** *Boston M. & S. J.*, 1916, clxxiv, 534.

Visceroptosis, in the sense that the organs assume a lower level in the abdomen than we are in the



habit of calling normal, is, in the opinion of the authors, in a large majority of cases a congenital condition or a reversion to a more primitive type of development. Their conclusions are based on a study of 1,600 patients complaining of digestive disturbances, 898 of which were subjected to a routine roentgen examination. All stomachs in which the lowermost point reached more than one inch below a line between the iliac crests were included in the ptotic classification. On this basis, of the cases examined by the roentgen ray 64.4 per cent had gastropotosis. The condition was slightly more frequent in women than men, and in individuals under forty years than over that age, in both

males and females. It occurred more often in single than in married women, and was associated with ptosis of the other viscera of the chest and abdomen in varying degrees in many of the cases.

Improper garments, occurrence of pregnancy, or any other incidental causes, play no part or at most only a very minor one in the production of the condition. The authors hold that it is intimately related to the structure of the body and probably arises from some congenital predisposition. Ptosis in itself is not a disease. Mild degrees of it may, under certain circumstances, cause symptoms, whereas marked types need not necessarily impair the functions of the affected organs. A. HARTUNG.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Henderson, M. S.: Loose Bodies in the Knee-Joint.** *Am. J. Orth. Surg.*, Rochester, 1916, xiv, 265.

The author classifies loose bodies in the knee-joint as follows:

1. Fibrinous loose bodies, intrinsic in origin.
2. Bodies composed of organized connective tissue, e. g., bone and cartilage, intrinsic in origin.
3. Loose foreign bodies, extrinsic in origin.

He recommends that in the operation the most rigid asepsis be observed and usually a general anæsthetic is necessary. The incision may be laterally on either side or the patella may be split. The condylar incision is better for the removal of the meniscus. If the body is in the posterior part of the joint the incision described by Brackett and Osgood is the best. If the body eludes the surgeon, a second attempt at a later date is better than a too prolonged search.

The author's conclusions are as follows:

1. Fibrinous loose bodies are due to some diseased condition of the joint, and do not cause mechanical derangements.
2. Organized connective-tissue loose bodies produce mechanical derangements.
3. Loose bodies may have as their primary cause some condition such as osteo-arthritis or Charcot's disease but the secondary cause is direct or indirect trauma.
4. Osteochondritis dissecans is a group more or less distinct from the rest. The bodies seem to be produced by very slight indirect trauma.
5. Trauma, direct or indirect, is essential to the production of a loose body.
6. Surgery offers the only permanent relief, and the general condition of the patient being satisfactory the bodies should be removed.

PHILIP LEWIN.

**Young, J. K.: A Case of Arrested Development of the Carpus and Tarsus.** *Am. J. Orth. Surg.*, 1916, xiv, 221.

The author was unable to find a recorded case of bilateral club-foot and club-hand due to arrested development or from congenital absence of bony structures.

He reports a case of a ten-year-old girl with the condition, in which he thinks the arrest of development was probably caused by some acute infection, general in character but its exact nature unknown.

PHILIP LEWIN.

### FRACTURES AND DISLOCATIONS

**Skilern, P. G., Jr.: The Diagnosis of Fracture by Physical Examination Versus Skiagraphy.** *Interst. M. J.*, 1916, xxiii, 256.

By obtaining a careful history of the mechanism of the injury and by a brief and gentle physical examination with the elicitation of true "wincing" tenderness, the diagnosis of fracture can be established in the great majority of cases without the aid of a skiagram.

The chief value of a skiagram consists in checking the extent of the deformity. A skiagram must be considered merely as one of the many signs of fracture.

It is more difficult to diagnose "contusion" and "sprain" than to diagnose fracture. Such diagnoses are often but cloaks to cover hasty and incomplete physical examinations, and should presuppose negative results following the exhaustion of every means at command to prove the presence of fracture.

F. D. DICKSON.

**Eikenbary, C. F.: The Fracture Problem.** *North-west Med.*, 1916, xv, 109.

The author in this general paper calls attention to the seriousness of every fracture. He lays stress upon proper alignment and its relation to function. Between the open and closed methods

of treatment he thinks there is a happy medium. He advises the open treatment in fractures of both bones of the leg or arm with irreducible overriding; fracture of the femur with over-riding; fracture of the patella; and most fractures of the olecranon. If there is no infection, operation is indicated at once. Massage and manipulation should be begun at once in the closed, and after a few days in the open, operative treatment. In compound fractures he operates at once. In ununited fractures the bone-graft is recommended.

E. B. MUMFORD.

**Rosenzweig, S. B.: The Causes of Prolonged Disability from Fractures.** *N. Y. M. J.*, 1916, ciii, 640.

Rosenzweig urges that as much care be given to the prevention of prolonged disability after fractures as is given to the various operative procedures used in their reduction.

The causes of prolonged disability may be general or local. The general causes are less frequent. Among the most important are cachexias, as in tuberculosis and malignancy and the severe anæmias; circulatory disturbances, as in cardiorenal or hepatic diseases; nervous disorders, as in tabes, paresis, or myelitis. Old age is also important.

The local causes are divided into three groups: (1) amount of bone injury and damage to soft parts; (2) the sequelæ of poor reduction, malunion, delayed fibrous union and non-union, and excess of callus and its results; (3) the result of insufficient or improper care, such as pressure ulcers, muscular atrophy, ischæmic contracture, and adhesions within the joints and tendon sheaths.

LYDD T. BROWN.

**Henderson, M. S.: The Transplantation of Bone in Ununited Fractures of the Shaft of the Humerus.** *Ann. Surg., Phila.*, 1916, lxiii, 464.

Henderson reports 10 cases of ununited fracture of the shaft of the humerus operated upon at the Mayo Clinic, with the following results. In 4 cases union was obtained at the first operation, in 3 a second was necessary, in 2 no data could be obtained as to the final results, and in one no union is known to have occurred. In 2 cases there was primary musculospiral paralysis produced at the time fracture occurred. In one no attempt to trace the nerve was made; in the other the severed ends were encased in a fascial tube made from the fascia lata, the operation being too recent to state the result. One case developed the same kind of paralysis at the time of operation from too vigorous retraction, but at the end of one year full function was restored.

He arrives at the following conclusions:

1. The transplant must be as large as is practical (6 inches by one-half inch or larger). It must extend well past the thinned decalcified ends into the hard healthy bone beyond.

2. The inlay is the method of choice.

3. Adequate post-operative fixation is necessary. A split plaster-of-Paris spica prepared a few days before operation can be fastened on with adhesive strips immediately after the operation is completed, thus eliminating the difficulty of applying the spica and the danger of disturbing the graft thereby. Two or three weeks later when the wound has healed, and the stitches have been removed, a new cast can be applied carefully with the patient sitting up.

4. By removing the bone-graft from the internal, flat surface of the tibia, the strong crest of the bone is left to perform its important weight-bearing function. The patient may be allowed to walk in from 12 to 14 days and by this time the blood-clot filling in the bony defect has become sufficiently organized so that no hæmorrhages will occur when the leg is used.

5. A properly applied spica cast may be comfortably worn for 3 months when in all probability union will be complete.

R. S. BROMER.

**Hawley, G. W.: A New Method of Fracture Fixation.** *Interst. M. J.*, 1916, xxiii, 277.

Hawley describes a method of clamping oblique or transverse fractures by means of wire in such a way that the wire may be withdrawn from the wound whenever desired without disturbing the fixation or making a fresh incision.

The instrument consists of a long, slender bar, a loop of heavy, woven, bronze, or ordinary picture wire, attached to a sliding clock and thumbscrew. The wire loop is designed to encircle the bone and engage the end of the bar to form a false knot. By turning the thumbscrew in one direction the loop can be tightened, and by turning in the other direction the loop is released and withdrawn. For application the fracture is exposed in the usual way and the apparatus applied after reduction of the fragments; the wound is then closed leaving the bar protruding, and dressings and a plaster cast are applied. The clamp may be left on as long as desired and withdrawn by loosening the loop and allowing it to slip off the end of the bar.

From experience in 17 cases the author concludes that the instrument has its field of usefulness in fractures where there is much tendency to displacement. A few cases have become infected, but only in a mild degree, and healing was without incident.

F. D. DICKSON.

**Simmonds, B. S.: A Method of Treating Gunshot Fractures by an External Fixation Apparatus.**

*Brit. J. M.*, 1916, i, 481.

The author describes an apparatus for holding in apposition the fragments in compound fractures. By means of an aseptic operation he inserts into the bones at a distance from the seat of the fracture, screws which are long enough to project well beyond the skin and to immobilize the fragments by



means of a rigid plate fixed to the screws by nuts, the entire operation being done without interfering with the original wound.

The advantages of the method are: (1) the apparatus is simple and inexpensive; the operation is simple and easily performed; the original wound is not interfered with and healthy tissues are not extensively opened.

LLOYD T. BROWN.

### SURGERY OF THE BONES, JOINTS, ETC.

**Cohn, I., and Mann, G.: A Further Study of Bone Repair.** *South. M. J.*, 1916, ix, 235.

The authors give a report of studies in bone repair from experiments done within the last two and a half years. The literature since 1913 is reviewed and grouped into two schools: one in which claims are made that periosteum makes bone, and the other in which claims are made that periosteum plays no rôle in new bone formation. The conclusion from the study is that the periosteum is a means of protection against infection, a source of added blood supply, a limiting membrane, and its presence favors an earlier repair of defects, but the healing in its absence is bony nevertheless.

The authors found that free transplants of periosteum in the anterior chamber of a cat's eye did not live and produce bone. Free periosteum wrapped around the carotid artery showed no growth of bone. Resections of the fibula, subperiosteally, leaving the closed periosteal tube behind, gave no regeneration of the fibula from the periosteal sheath. The authors give a summary of the literature up to date in regard to callus formation. In 19 fracture experiments where the fibula in the same animal were broken simultaneously, one leg having the periosteum removed first and one having the periosteum remaining intact, showed repair in both cases. In the bone from which the periosteum had been removed the callus formation seemed to be greater than in the other, but not so far advanced in its development, up to 38 days after the experiment started. A series of experiments where a button was trephined from the bone subperiosteally and the periosteum sutured back into place again, in contrast to a case where the same operation was done but the periosteum was removed, showed that new bone was formed in each instance similarly, namely, that it seemed to spring from the medullary part of the bone, working toward the surface; only in the case where the periosteum was not removed, the repair was much greater in extent. In regard to the fate of small free bone transplants, uncovered by periosteum, the authors state that sooner or later these perish.

In regard to intramedullary transplants, the authors think that although osteogenesis on the part of the recipient bone is stimulated, yet the ultimate fate of the transplant is death. Protocols of the experiments with the appropriate bibliography are given in the original article.

**Campbell, W. C.: General Heliotherapy in the Treatment of Bone and Joint Affections.** *Am. J. Orth. Surg.*, 1916, xiv, 191.

The author used the sun treatment in 28 cases, in 8 of which sufficient time had not elapsed to obtain results. Of 4 with fistulæ improvement was rapid in 3, but for various reasons exposures could not be continued. Of the remaining 16 in which treatment was satisfactorily given, 7 were tubercular, 4 osteomyelitis, 2 pneumococcic arthritis, 1 peri-arthritis following direct infection of the knee-joint, 1 arthritis deformans, 1 decubitus.

He concludes:

1. That there is rapid expulsion of sequestra.
2. That there is marked and early beneficial effect in severe septic conditions.
3. That there is rapid evolution of the tubercular process resulting in bony ankylosis in every case.
4. That there is much difficulty in having the exposures regularly given in well-regulated general hospitals.
5. That close attention should be given to orthopedic measures for the prevention of the deformity as in any previous treatment, by using removable apparatus and extension.
6. That a decided advancement has been made, not only in the treatment of surgical tuberculosis, but in certain other affections of bones and joints.

PHILIP LEWIN.

**Roberts, P. W.: The Influence of the Os Calcis on the Production and Correction of Valgus Deformities of the Foot.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In this paper attention is called to the importance of the os calcis as a basic factor in the cause of valgus deformities of the foot and as a medium through which weak-foot and moderate paralytic valgus can be controlled. The observations are based upon the principle that a body with an arc for its base can support a superimposed weight without tilting only when the thrust of that weight is received over the center of balance. It is shown that the under bearing surface of the os calcis is, on cross-section of the bone at its point of contact with a plane surface, an arc, and is therefore subject to the law just cited. It is further demonstrated that because of the firm ligamentous union of the os calcis to the rest of the foot any rotation of the heel bone must alter the strain on the longitudinal arch, raising it if the superior surface of the os calcis is rotated outward and depressing it if rotated inward. Therefore, by means of a plate designed for the purpose, weak-foot and moderate paralytic valgus may be controlled without any prop whatever under the arch. The same principle is applied in the surgical treatment of acquired varus.

**Lord, J. P.: Arthroplasty of the Interphalangeal Joints.** *Am. J. Orth. Surg.*, 1916, xiv, 212.

The author used free fat and fascia from the fascia lata to relieve some cases of stiff fingers and

some with congenitally contracted and pathologically dislocated fingers. He usually employed 1:400 novocaine locally and a tourniquet. It is necessary to control bleeding thoroughly before transplants are placed and the wound closed.

While his results were somewhat disappointing in the interphalangeal joints of the fingers, the majority of the joints were greatly improved, some to the extent that the patients were satisfied because the fingers became usable, whereas before they were almost useless.

Free full motion was obtained in none of the cases. Some joints, with a chronic arthritis, lingering and somewhat painful before operation, became painless afterward.

PHILIP LEWIN.

**Tarnowsky, G. de: The Heterogenous Bone-Peg; Its Possibilities and Limitations.** *Surg., Gynec. & Obst.*, 1916, xxii, 610.

In view of the present well-generalized belief that all bony transplants are ultimately absorbed, the author was led to try sterile intramedullary pegs derived from the long bones of cattle. Sufficient time has not yet elapsed to permit of a positive statement regarding the exact interval which must elapse between the implantation and final absorption of the peg, but serial skiagraphs of operated cases show the bone to be slowly absorbing. Clinically the results have, in the main, been good. The callus, while tending to be excessive, has been firm and primary union has been obtained in all but one case.

The distinct advantages of the soup-bone pegs are: (1) they are easily obtainable; (2) they can be sawed or chiseled into any length or thickness; (3) they are easily sterilized; (4) they do not become brittle even after repeated boiling. The pegs are especially indicated in transverse or slightly oblique fractures as well as in fractures of the neck of the humerus or femur. They are less satisfactory in markedly oblique fractures or fractures with considerable splintering of the shaft.

**Soule, R. E.: The Use of the Autogenous Bone-Graft Pin in the Treatment of Painful Flat-Foot, Paralytic Valgus, etc.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In his paper read before the American Orthopedic Association in Washington in May, 1916, Soule gives his observations from experience gathered in his investigations of painful foot disability over an extended period in orthopedic practice and emphasizes the fact that in acquired deformities of the foot the astragalus is seldom if ever displaced laterally. From his findings he has applied a new method of treatment to correct deformity and relieve pain and disability which is applicable to a very large percentage of such conditions. He cites 33 cases operated on, giving numerous illustrations of his cases before and after treatment, including painful pronated flat-foot, paralytic valgus, fracture displacements of the tarsus, and osteo-arthritis where

he has applied arthrodesis of the astragaloscaphoid joint and autogenous bone-graft pinning of these bones with extremely satisfactory results.

The indications for this method of operating in flat-foot are:

1. Where other methods have failed to restore the foot to full function, painlessness, and normal contour after reasonable trials and a relapse toward the original deformity takes place.

2. Where bony prominences of the tarsus preclude the use of the rigid flat-foot plate and where pronation of the foot is a predominating part of the deformity as found in cases of relaxed pronated weak feet.

3. In cases of pronation of the foot with depression of the longitudinal arch as a result of fracture of the os calcis or astragalus, or displacement of the scaphoid.

In cases of pronation and valgus of the foot following infantile paralysis involving the anterior and posterior tibial muscles or a similar position in spastic paralysis.

In cases of osteo-arthritis of the foot where the predominance of pain is associated with the mid-tarsal joint with or without valgus or pronation.

The technique of the author's operation is as follows: With the foot and leg prepared for operation, preferably by the iodine method, and a tourniquet applied above the knee, an incision two and a half to three inches long is made on the dorsum of the foot, along the inner border of the tendon of the anterior tibial muscle from the bend of the instep. At the distal end of this incision it is curved inward and downward to expose the inner prominence of the scaphoid through which the bone-pin is to be inserted.

Through this incision on the dorsum of the foot the entire width of the astragaloscaphoid articulation is exposed.

The articular connecting ligaments of the entire width of the superior area of the joint are dissected away and the forefoot forced downward to expose freely the articular surfaces.

With the author's double curved gouge made to fit the ovoid of the head of the astragalus and the corresponding concavity of the scaphoid the entire articular cartilage is easily removed from both surfaces, preserving the ovoid of the head of the astragalus and the corresponding concavity of the scaphoid, thus assuring a greater area for bony contact and accuracy of relation of the two bones in apposition.

With the forefoot forced into a normal position and held by an assistant securely in proper adduction a hole three-sixteenths to one-fourth inch in diameter is made with the motor drill through the inner extremity of the scaphoid from before backward, obliquely outward and upward into the head of the astragalus and of sufficient depth, one and one-half to two inches, to securely lock the scaphoid to the astragalus. The drill is disengaged from the motor and left in position in the drilled hole. A strip



of cortical bone is next removed from the crest of the tibia sufficiently thick to form the dowel-peg of the same size as the drill used. This can be done with a chisel but preferably with the single or twin motor saw. When shaped in the dowel-shaper it is ready to be substituted for the drill which has been left in position in the hole drilled through the scaphoid into the astragalus. The dowel is introduced into its bed immediately the drill is withdrawn, the foot being held firmly and steadily in its corrected position by an assistant during the withdrawal of the drill and the introduction of the dowel-pin, which is driven home by a few taps of the mallet. The excess length of the pin is cut off with forceps or the motor saw flush with the bone surface.

The skin wounds in the leg and foot are closed with catgut mattress sutures without drainage, dressings are applied, and a plaster of Paris cast put on from the toes to the knee with the foot at a right angle.

Convalescence is uneventful. The patient is up out of bed in a chair with foot and leg in a horizontal position in three or four days. At the end of two weeks he can be up on crutches for intervals during the day if a single foot is operated. At the end of six weeks the cast is removed and massage, active exercise, and weight-bearing is begun. At the end of eight weeks, in the author's experience, full weight bearing can be allowed.

The advantages of the operation are:

1. The period of treatment is greatly shortened.
2. There is no possibility of a relapse to the former condition and position.
3. A strong, painless, stable foot is the result.
4. There is no diminution of the necessary function of the foot.
5. There is entire relief from the torture and annoyance of wearing flat-foot arch supports or other external supporting braces or specially constructed shoes.
6. The operation is applicable to cases much younger than could heretofore be treated by any operative procedure.
7. The technique is simple, definite, and accurate.

**Lewis, D.: Transplantation of Tissue.** *Lancet-Clin.*, 1916, cxv, 296.

The author believes that the autoplasmic graft is the most successful of the skin transplants. He believes that in bone-grafting, the ideal graft is one containing enough compact bone to lend support and fixation when required, and not sufficient to cause cellular death; hence he prefers the anteromedial surface of the tibia for grafting purposes; that the compact bone of a graft is gradually absorbed to be replaced by the periosteum and the endosteum, that bone-grafts placed in cavities, following curettage of giant-cell sarcomata or fibrous osteitis, do not live because of the bleeding into the cavity, thereby preventing vascularization; that bone transplanted into infected areas lives and reacts to the infection like normal bone; and that the inlay graft gives

better results than the intramedullary splint in ununited fractures.

He describes in detail the technique of an operation as performed by McArthur upon one of his own patients. In this case the flexor tendons of the forearm were torn, and were repaired by transplanting strips of fascia, which had been previously covered by a layer of subcutaneous fat.

He believes the success of a tendon-transplantation or of a repair of a tendon by fascia depends upon the early function of the part after the operation.

Lewis and Kirk, having by experiments successfully bridged defects in nerves by fascial tubes, now believe this method practical when nerve-tissue cannot be secured as a transplant. J. R. MARTIN.

**Watson, C. G.: Amputations at Base Hospitals in France.** *Brit. M. J.*, 1916, i, 479.

The author explains the reasons for and encourages the use of the flapless or flush amputation, the method of Antyllus, as revived and used in the present war. The main points to be kept in view in all amputations are:

1. To keep the patient alive during and after the operation.
2. To perform an operation which will check the spread of the infective gangrene and prevent septicæmia.
3. To save as much limb as possible.

The disadvantages of the flap amputation method are:

1. There will be less chance of ultimately saving the patient's life because there will be less chance of checking infection.
2. There will be more chance of the patient losing his life at the time from shock.
3. For the amputation to succeed it will have to be performed as high as or higher in the limb than the second stage of a primary flush amputation.
4. Healing by first intention cannot be expected. (The cases must be seen to appreciate this.)

5. The risk of secondary hæmorrhage (a very grave danger in these cases) is greatly increased. Since the routine adoption of the flush method the author states that not a single case has been lost from secondary hæmorrhage following amputation in the hospital he is connected with. The only death in their hospital from secondary hæmorrhage after amputation, during the last six months, occurred in a case operated on near the front by the flap method. Secondary hæmorrhage occurred during transit and again after admission to the hospital.

6. The need for reamputation for sepsis or hæmorrhage may be expected at a time when the patient is unable to stand further operation, and often when there is not enough limb available for an amputation.

The advantages of the flush method are:

1. Rapidity with minimum shock.
2. A plain open surface for dressing, which is

favorable to the subsequent control of sepsis and which prevents pocketing.

3. Great diminution in the risk of secondary hæmorrhage.

4. The operation provides the best mechanical relief of gas tension by dividing all the tissues at right angles to the muscle planes.

5. It allows a temporary amputation to be performed close to the site of the injury, so that a permanent amputation can be performed later (when sepsis is under control) a little above the injured area.

6. In cases associated with fracture the proximal end of the bone can be and should be left intact (that is, not sawed through) and projecting beyond the plane of muscle-section, thus minimizing the risks of osteomyelitis and also providing a useful medium (1) for the application of pressure by means of dressing in case of hæmorrhage (a practical point of great value), (2) for moving and fixing the limb, and (3) for the application of extension to the skin.

The flush circular method may be modified, according to circumstances, by a single flap cut from the damaged area and turned back, thus saving a few inches of bone in the final result, although this flap is liable to slough owing to anaerobic or streptococcal infection.

The author lays stress on the after-treatment of the flapless amputation. At the secondary operation it is important not to open up muscle planes because of the danger of "flare-ups." The muscles attached to the bone should be carefully separated from the periosteum by snipping with scissors until the amount of bone required to be removed has been bared. If the bone is divided without lacerating the granulation tissue the operation can be done without any local or general reaction. The periosteum should not be stripped back from the bone, otherwise new bone will be thrown out in the muscles.

During the interval between the first and second operation the skin should be kept stretched by means of an extension. The second operation can and should be performed before any serious cicatricial contraction has occurred. In several instances a completely healed and comfortable stump has been secured within a month of the original amputation.

LLOYD T. BROWN.

**Kelly, M. F.: The Flapless Amputation.** *Brit. J. Surg.*, 1916, iii, 676.

The author strongly advocates the flapless method of amputation in (1) gaseous gangrene, (2) compound comminuted fracture, and (3) multiple wounds.

The author summarizes the advantages of the method as follows: (1) it saves life; (2) saves length of limb; (3) lessens the risk of secondary hæmorrhage; (4) arrests the spread of infection, whereas in flap amputations sepsis often recurs in the flap and spreads up from there.

The amputation is done as follows: The skin and deep fascia are divided, usually by a circular incision.

After retraction has occurred the muscles are divided at the level of the retracted skin — not too quickly to allow retraction of the layers; then the bone is sawed off flush with the muscles; the vessels are secured and nerves properly shortened. Retraction is easily overcome by extension once the face of the wound is clean.

The method enables the amputation to be done close up to the involved area and would seem a rational procedure under conditions which exist at the front.

F. D. DICKSON.

**Bryan, C. W. G.: The After-Treatment of Amputation Stumps.** *Brit. M. J.*, 1916, i, 480.

The author describes an apparatus for making traction on the skin and soft parts after amputation of either the flap or the flapless variety. It consists of longitudinal strips of two-inch adhesive strapping applied to the amputation stump from the joint above to about an inch from the edges of the wound and then prolonged about twelve inches beyond the edge of the stump. These strips are attached to an aluminum ring eighteen inches in diameter. This ring is attached by three pieces of cord tied to it at equal distances from one another, the cords passing through pulleys hooked to a Balkan splint to which an extra crossbar of wood has been bolted. The free ends of the cord are tied together and the weights are hooked on. For a thigh amputation a weight of about eight pounds is used, while for the arm about five pounds suffices.

LLOYD T. BROWN.

## ORTHOPEDICS IN GENERAL

**Roberts, P. W.: Paralytic Feet.** *N. Y. M. J.*, 1916, ciii, 826.

The operation proposed applies to practically all forms of paralytic feet where there is instability of the ankle. It is neither so radical as complete astraglectomy nor so uncertain as arthrodesis. The mechanical problem presented in cases of instability of the ankle following paralysis is the restriction of anteroposterior motion at the tibioastragalar joint and lateral motion between the os calcis and astragalus. Control of either of these joints without control of the other will yield imperfect results; therefore it is necessary that both be included in any plan to stabilize the foot. If movement at the ankle-joint is obliterated, there will still be enough anteroposterior motion between the os calcis and the astragalus and between the head of the astragalus and the scaphoid to maintain a considerable degree of elasticity in the foot. Hence the operation under consideration aims to efface the astragalotibial joint and to drop the external malleolus down sufficiently to overlap the os calcis, thus blocking lateral motion between this bone and the astragalus. Through a fishhook incision, such as is commonly used for astraglectomy, the astragalus is exposed and dislocated from the mortise formed by the lower end of the tibia and



fibula. The astragalus is then remodeled by resecting the upper half on a line corresponding to the superior border of the neck, leaving a flat surface. The sides of the bone are trimmed to transform the astragalus into a rectangular block. The mortise of the ankle is then squared out to fit over the block-shaped astragalus. The foot is displaced backward and put up in plaster of Paris. This dressing is removed at the end of two weeks for inspection of the position of the foot, which at that time may be altered, if found necessary, and another plaster is applied. The patient is allowed to walk on the foot four weeks after the operation and at the end of ten weeks the plaster is removed and the foot is ready for use.

The advantages claimed for the operation are: greater stability, less likelihood of relapse, and a much shorter period of after-treatment than is necessary with operations now in use.

**Bauman, G. I.: Congenital Club-Foot.** *Cleveland M. J.*, 1916, xv, 246.

In discussing the treatment of congenital club-foot Bauman expresses the opinion that no operation, not even a tenotomy or fasciotomy, should be performed until every other method has been tried. The only exceptions to this rule are those neglected or relapsed cases found in older children or adults in which there is a marked rigidity due to bony deformity. Even these cases should receive thorough manipulation before any open operation is performed. Bauman believes that the most perfect results follow those cases in which no open operation has been performed.

ARTHUR J. DAVIDSON.

**Painter, C. F.: Hallux Rigidus.** *Boston M. & S. J.*, 1916, clxiv, 708.

The author considers that the chief factor in the etiology of hallux rigidus is the irritation caused by the junction of the vamp and the upper part of the shoe, upon the end of the metatarsal bone of the great toe. To the frequent anatomical variation in the length of the tarsal and metatarsal bones, the author attributes the occurrence of the condition in unilateral cases.

The conservative treatment consists in the wearing of custom-made shoes and the temporary use of a metal plate to limit motion of the affected joint.

Surgical treatment consists in the removal of the ridge on the dorsal surface of the metatarsal or, in very severe cases, the resection of the head of the metatarsal bone.

ARTHUR J. DAVIDSON.

**Meisenbach, R. O.: Painful Anterior Arch of the Foot; an Operation for Its Relief by Means of Raising the Arch.** *Am. J. Orth. Surg.*, 1916, xiv, 206.

The author discusses two types of anterior or transverse arch of the foot which are commonly

met with; namely, the flexible and the rigid. The flexible may be associated with a low posterior or longitudinal arch, pronation or weakness of the ankle, and a general atonic condition of the muscles of the leg and foot, the toes usually being straight. The symptoms in this type may be referred to any part of the leg and ankle, but frequently to the anterior portion of the foot in the form of intermittent metatarsalgia. The symptoms generally occur when the foot is in a weight-bearing position.

In the case of the rigid, reversed arch, as Meisenbach calls it, the pain is most marked in the weight-bearing position but frequently continues after the weight is removed from the foot, or when the foot is at rest. The entire metatarsophalangeal girdle is anchored down by ligamentous thickening. The flexor tendons of the second, third, and fourth toes are tense and seem too short to allow the toes to extend. Deep-seated calluses are found under the former arch.

The treatment of the flexible type consists in the use of proper plates, proper shoes, and exercises.

For the rigid type the author recommends osteotomy of the second, third, and fourth metatarsal bones. He then applies a felt pad under the arch and a plaster dressing extending to the knee. The advantages of the operation are:

1. The immediate relief of symptoms with the early dropping off of the calluses.
2. The straightening of the toes, with a high anterior arch and no deformity of the foot.
3. The operation is practically bloodless and the danger of infection practically nil.
4. The metatarsophalangeal joints are not opened and the heads of the metatarsal bones are not resected.

PHILIP LEWIN.

**Loosee, J. R.: Syphilitic Osteochondritis.** *Long Island M. J.*, 1916, x, 156.

The author maintains that osteochondritis is one of the most characteristic lesions of congenital syphilis occurring in the early weeks of life. On account of the listless and motionless attitude which the infant assumes, it is clinically known as pseudoparalysis. The lesion is observed at the junction of the diaphysis and the epiphysis of nearly all the long bones. The disease is generally observed before the fourth month of life, but cases have been reported as occurring later. In severe cases when the epiphysis separates spontaneously from the diaphysis, the fracture surface is irregular and rough, while in a normal separation the surface is smooth.

The chief symptom of the disease is the loss of function of one or more of the extremities. The articulations are swollen and painful and epiphyseal separation may take place. Symmetrical joints are often involved and the patient assumes a flaccid attitude.

The prognosis depends upon an early diagnosis and prompt treatment.

R. B. COFIELD.

**Jones, R.: Positions of Election for Ankylosis Following Gunshot Injuries of Joints.** *Brit. M. J.*, 1916, i, 609.

The author discusses the position of election for the various joints as follows:

In the shoulder-joint, the arm should be abducted to about 50°. The elbow should be slightly in front of the coronal plane of the body, so that when it is at right angles and the forearm supinated the palm of the hand is toward the face.

As to the elbow-joint, the majority of men are better off with the fixation at 100°. In cases in which both elbows are involved, one should be fixed at 80° and the other at 100°.

In the forearm, if the movements of pronation and supination are lost the radius should be fixed midway between pronation and supination.

All injuries of the wrist-joint should be treated with the wrist dorsiflexed.

In the hip-joint, ankylosis should be encouraged in a position of very slight abduction, with thigh extended and very slight outward rotation.

The knee should be fixed in an extended position.

In injuries of the ankle, the foot should be kept at a right angle with the leg, so that the sole impinges on the ground in a slightly varus rather than a valgus position.

In answer to the question "What should be done with a flail-joint?" Jones says, "Secure by operation an ankylosis in the most useful position." The only exception is the hip-joint where by means of simple mechanism a very useful limb may be obtained in spite of the joint being flail.

PHILIP LEWIN.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Hassin, G. B., Johnstone, K. L., and Carr, A. M.: Bullet Lesion of Cauda Equina.** *J. Am. M. Ass.*, 1916, lxi, 1001.

The patient, a man of 28, complained of pain in the left lower extremity. The pain would "jump" from the left buttock to the left popliteal region, whence it would reach the left little toe and spread over the foot and the other toes. It would stop for about five or ten minutes and then begin again. He could not sleep nights, could not find rest in the daytime, and could not do his work (that of a watchman), but he was able to walk.

The pain originated six years previously after he had been shot in the back. One attempt to remove the bullet, four hours after he was shot, was entirely unsuccessful. Following the shooting, the patient immediately became paralyzed in both lower extremities. The paralysis was combined with anæsthesia and loss of sphincter control. A month later cystitis developed, which persisted for two years. He could not move around for two years and had to be "carried all this time in a rocker." The symptoms plainly indicated involvement of some of the motor and sensory roots of the cauda equina that supply the lower limbs with motion and sensation.

A curved incision was made from the first lumbar to the first sacral spinous process. The spinous processes of the second, third, and fourth lumbar vertebrae were exposed and removed. The laminae of the same vertebrae were removed and the dura exposed. The dura was split and dissected free from adhesions to the cauda. The bullet was found at the level of the third lumbar vertebra, surrounded by two solid scars. It was carefully dislodged with blunt dissectors and removed. The slightest possible injury to the surrounding tissues was carefully avoided.

The operation was followed by numbness in the

genitals, buttocks, about the anus, and by retention of urine for about six days. Four weeks after the operation the wound cleaned up and for about seven weeks there still was severe pain in the legs, which, however, was gradually disappearing and the patient was getting firmer on his feet. Two months after the operation the pain disappeared entirely, the gait became practically normal, the calf muscles increased in volume one inch, the pain sensation was found to be normal — but only in the right leg — while in other areas the sensibility showed the same disturbances as before the operation. No change was found in electric findings, in the reflexes, or in the muscle power. The improvement was so marked that the patient insisted on leaving the hospital and felt able to resume work.

EDWARD L. CORNELL.

**Kleinberg, S.: Congenital Anterior Curvature of the Spine.** *J. Am. M. Ass.*, 1916, lxi, 736.

The author describes a case of true congenital lordosis of the spine not associated with any other deformity.

The case is described in some detail as to X-ray and laboratory findings. His conclusions are that this was an instance of congenital lordosis in which he believes heredity played no part and despite the marked lordosis there was no albuminuria.

C. C. CHATTERTON.

**Armour, D.: Gunshot Wounds of the Spine; Their Surgical Aspect.** *Lancet*, Lond., 1916, cxc, 770.

The author divides gunshot wounds of the spine into two classes: (1) those in which there is no interference with the function of the spinal cord; (2) those in which there is more or less interference with the function of the spinal cord with or without obvious injury to the vertebral column.



Injury to the vertebral column may be followed later by effects of inflammatory products: adhesions, narrowing of the spinal canal, intra- or extradural clot, etc.

Immediate injury to the cord may be caused by: (1) the missile passing through part or the whole of the cord; (2) fractured bone causing compression, contusion, laceration, or complete division; (3) concussion.

The author has found the X-ray to have only confirmatory value in localizing bone injury and foreign body position.

The points of importance arising regarding operative intervention are: (1) Will any benefit to the patient result from the operation? (2) Will his life be endangered by the operation? (3) Will he be made worse by operation?

The author then discusses indications for operation and urges interference under proper surgical skill and asepsis in all cases in which complete section has not taken place, providing the patient is in a fair general condition. He says: "It is unfair to the patient and unfair to surgery to wait on and on till hope gives place to despair and then call in a surgeon as a last resort to perform the impossible."

Operation is therefore indicated (1) to relieve pressure from depressed or displaced fragments of bone; (2) to relieve pressure from blood-clot or from extensive hæmorrhage, either extra- or intradural; (3) to relieve pressure and prevent further destruction from œdema by enlarging the constricted bony canal; (4) to remove the danger of pressure from exudate and inflammatory thickening.

H. W. MEYERDING.

**Collier, J.: Gunshot Wounds and Injuries of the Spinal Cord.** *Lancet*, Lond., 1916, cxc, 711.

Eighteen months' service has given the author an excellent opportunity to study gunshot wounds and injuries to the spinal cord. The nature of lesions caused by high-velocity bullets, shrapnel, fragments of shell casing, and by the concussion of high explosives without any external wound are:

1. Direct lesions—missile through cord.
2. Indirect lesions: (a) those due to an in-driving of bone, etc., into the spinal canal; (b) impact lesions where the missile strikes against the bony wall of the spinal canal; (c) concussion lesions from the shock of high explosives.
3. Secondary lesions: perithecal and intrathecal hæmorrhage, medullary hæmorrhage and thrombosis, meningitis, œdema (may come late and cause increased symptoms).
4. Remote lesions which may be found anywhere in the spinal cord and chiefly near the surface: spots of necrosis, sieve-like rarefaction, punctiform hæmorrhages, œdema, swelling of axons. These result from passage of a missile through the cord or from concussion suddenly raising pressure.

Case histories illustrating the above lesions are cited. Especially interesting are those resulting

from concussion and to shell bursting near the patient without external wound yet producing severe local transverse lesions of the cord.

Root lesions are produced by projectiles directly or indirectly, the latter from subperiosteal hæmorrhage, periosteal swelling, or pachymeningeal hæmorrhage.

Intrathecal hæmorrhage is discussed and the difficulty of explaining the physical signs unless this condition is borne in mind is shown by case history.

A case is cited of total necrosis of the distal segment of the spinal cord at autopsy in a case without sign of hæmorrhage or septic process three months after injury which had produced a total transverse lesion at the third dorsal segment.

The author discusses reflex actions, contractures, disturbances of sensibility, and the distinction between root lesions and central lesions and prognostic indications.

H. W. MEYERDING.

**Hull, A. J.: Treatment of Gunshot Wounds of the Spine.** *Brit. M. J.*, 1916, i, 577.

To be successful, spinal operations must be performed at an early stage before any vital changes have occurred in the cord. By delaying operative interference, cases lose their chance of recovery either by the sepsis spreading or by pressure on the nerve tissue causing these vital changes to take place.

It would appear justifiable to operate upon spinal injuries when the X-ray localization shows a foreign body present in an accessible position, and especially when there is evidence of some remaining conductivity of the cord, as here the removal of pressure may be followed by great improvement. Pain in some spinal lesions is so intense that an operation is justifiable, whatever the lesion of the cord.

Three lines of treatment are indicated: (1) prevention of sepsis, (2) removal of gross pressure upon the spine, and (3) the prevention of complications which threaten life.

R. B. COFIELD.

**Sayre, R. H.: The Occurrence of Late Rickets.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

Rickets occurring in adolescents and adults is less uncommon than has been supposed. Its occurrence abroad has been much more frequently noticed than in this country. Apparently rickets in the adolescent is frequently of the recrudescence variety, and in a number of the author's cases the patients have been subjected to various operations for the relief of the deformity earlier in life, but no effort having been made to eliminate the underlying cause of the softening of the bones, the deformities had recurred, or else deformities of an equally disabling character had taken their place requiring further operative intervention.

In one case a girl, 19 years of age, who had had four previous operations before coming under observation, the femora were so soft that the osteo-

tome cut through at the first blow when a supracondyloid operation was done, but six months later after the patient had been fed upon phosphorus and cod-liver oil, the edge of the chisel was broken off while an operation was being performed upon the shaft of the femur to correct a twist there, and a second instrument was used to complete the operation.

In the case of a boy, 16 years of age, marked knock-knee had developed in the space of three months, and reasoning that if the bones were sufficiently soft to create so marked a deformity in so short a time, pressure could correct the position, the legs were put in plaster-of-Paris bandages, which were subsequently sawed through at the point of deformity, and wedged straight, a perfect result being secured without the necessity of breaking the bones. This boy was placed on phosphorus and cod-liver oil, and remained straight. These cases emphasize the necessity of attending to the underlying cause

producing the softness of the bones as well as merely correcting the deformity.

**Shackleton, W. E.: Some of the Surgical Aspects of Painful Back.** *J. Am. M. Ass.*, 1916, lxvi, 1600.

Shackleton describes an anatomic variation of the transverse process of the fifth lumbar vertebra, "the lumbar rib," and he cites three unmistakable cases, two of which when operated upon were entirely relieved. The condition arises in middle adult life after years of hard labor, but may also follow fracture, or some infection. The backache seems to be due to impingement of the process on the ilium, sometimes thus separating the sacro-iliac joint, or to impingement on the nerve itself. The fifth lumbar nerve seems to be the branch most commonly affected, causing most marked motor symptoms in the peroneal nerve. In the two cases reported, the prolonged processes were removed and instant relief occurred.

R. G. PACKARD.

## SURGERY OF THE NERVOUS SYSTEM

**Bucholz, C. H.: Partial Resection of the Motor Nerves in Spastic Paralysis.** *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In spastic paralysis the restoration of the function of the paralyzed limbs demands a long continued re-education and exercise treatment. A greatly defective balance and actual contracture may make rational exercise difficult if not impossible, and may require surgical interference.

Until recently operations on the tendons and muscles were practically the only operative procedures in use in these cases, but within the last two years operations on the nervous system directly have been done in various ways. Among these operations may be mentioned the following:

1. Resection of the posterior roots of the spinal cord (Foerster's operation).
2. Operations to cause temporary paralysis by the injection of alcohol into the nerve-trunks (Allison's method).
3. Partial resection of the motor nerves (frequently called Stoffel's operation).

Although the last-mentioned method has at times been used, it was through Stoffel's anatomical studies and clinical work that the method has been so thoroughly developed. Stoffel has shown that in the cross-section of the nerve-trunk the arrangement of the single bundles is practically the same in every person, so that anyone familiar with the anatomy of the cross-section will find without difficulty at a given place that bundle for which he is looking.

Stoffel's operation consists in a partial resection of the motor supply of the spastic muscles, either

after the motor branches have left the main trunk, or, within the main trunk itself. The latter method is used only when the former is rendered difficult or impossible by the anatomical conditions.

Stoffel's operation is, in the author's opinion, indicated in all cases of rather localized spasm with markedly defective balance which is not showing any improvement under exercise treatment.

The contra-indications are as follows:

1. The progressive character of the disease causing the spasticity.
2. Permanent contracture in which case the contractures should be eliminated first, and partial resection of the motor supply may be done later after a sufficiently long interval, if a markedly defective balance persists after exercise treatment.
3. Marked prevalence of the paretic element.
4. Mental deficiency or youth of the patient which prevents careful after-treatment by exercise.

Just as for the resection of the posterior roots it has been made an axiom by Foerster himself that developmental and educational exercise treatment is the most important part of the whole treatment, which is only to be made possible or easier by the operation, so too before doing Stoffel's operation one must be sure that an opportunity will be afforded to give the patient a sufficiently long careful after-treatment.

The technique of the operation is briefly described for partial resection of the motor supply of the triceps cruris and the pronator muscles of the forearm. A modification of Stoffel's operation by the author consisting in transplanting some of the motor supply of the triceps into the peroneal nerve, is briefly described.



**Hardouin, P.: Two Complete Nerve Sections, Treated by Suture with Functional Restoration in the Domain of the Injured Nerve** (Note sur deux observations de section nerveuse complète, traitée par la suture avec récupération fonctionnelle dans le domaine du nerf lésé). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 612.

The two cases reported by the author were selected from a series of 36 cases of complete nerve sections which were operated upon. These were the only cases which the author has been able to follow.

The first case was a resection and suture of the internal popliteal sciatic on the right. The op-

eration was done in January, 1915, four months after the injury, and voluntary motility was effective four months later.

In the second case there was a complete section of the radial nerve which was sutured in February, 1915. Voluntary movements in this case were not noticeable till ten months later.

In the first case the injury had not caused a total anatomic section of the nerve, but the presence of a voluminous neuroma necessitated resection.

In both cases there was complete restoration of the electric functions of the nerves.

W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESES, ETC.

**Lambert, R. A.: Tissue Cultures in the Investigation of Cancer.** *J. Cancer Research*, 1916, i, 169.

A review is given of the results which have been obtained with tissue cultures in studies upon cancer and related subjects. The technique is described and emphasis is laid on the fact that the temperature of the culture medium and the tissue does not have to be rigidly controlled while the cultures are being made; moreover, some time can elapse between the taking of the tissue specimen from the body and its immersion in the plasma medium in which it is to grow. There has been very little trouble from bacterial contamination, probably because of the fact that serum has a bactericidal property of itself. The principle in general consists in placing small pieces of tissue, 0.5 to 2 mm. in diameter, in plasma derived from the blood of the same animal, making the whole a hanging drop preparation and sealing it with vaseline.

Sarcoma and connective-tissue cells are wont to wander out singly or in chains, while epithelial cells, normal or neoplastic, tend to spread in sheets or groups. The cancer-cell, especially the sarcoma cell, tends to show a greater motility as compared with the corresponding normal element. Sarcoma cells may often be seen traveling through the medium at a rate equal to that of a polymorphonuclear leucocyte. This fact probably throws light on the mechanism of the invasive growth and spread of cancer in the body. The author calculates that a cancer-cell by means of this locomotion might in four weeks make its way to the axillary fossa. Continued propagation of normal cells, especially those of connective tissue, is as a rule much easier than in cases of tumor-cells. Many carcinomata and sarcomata are very difficult to propagate even in primary cultures, while others quickly die when transferred early into fresh plasma. On the other hand, connective tissue becomes much more active in subcultures. Tumor-cells are much more susceptible

to heat; that is, it kills them much more quickly than it does active tissue cells.

The author quotes Lambert and Hanes, who found that rat sarcomata cells will grow quite as well in the plasma of an immune rat as in the plasma of a normal rat without immunity. This observation affords further evidence that cancer immunity is not to be attributed to circulated antibodies of a cytotoxic nature. They are further able to show that an animal of foreign species, particularly a rabbit, may give plasma satisfactory for the growth of tissue elements derived from an alien species. The plasma of an animal that has been immunized to either the tissue or the blood of another is unsuitable as a medium of growth for the cells of the animal which supplies the immunizing substance. In other words, it is distinctly toxic for these cells. The author emphasizes the fact that variations in growth of preparations occur from the factor of the depth of the hanging drop and the density of the fibrin meshwork. These two factors influence the extent to which the active motile cells wander out. The author cites an instance where an extract of human tumor appeared to inhibit rather than to stimulate the growth of normal human cells.

He has been disappointed in stimulating tissue cultures by using Scharlack R and Sudan III. He thinks, however, that in spite of the fact that possibly with the exception of increased temperature there has been little found that will stimulate tissue growth, this is a most important and interesting field of investigation in regard to the cancer problem.

H. G. SLOAN.

**Calkins, G. N.: The Effects of Cancer Tissue and of Normal Epithelium on the Vitality of Protozoa; Didinium Nasutum.** *J. Cancer Research*, 1916, i, 205.

In experimental study, the author used didinium nasutum, which lives on protozoa and will not eat bacteria, so that he was able to control the factor of putrefaction, to a certain extent, in the food given them to live on. The carcinomata he used were

derived from tumors inoculated into mice, at varying intervals, so that when needed they were of the same age and approximately of the same size. The tumor was fed to the didinia in definite, stated amounts in addition to their normal food supply of paranechia. Two series of controls were run. All the didinia were derived from the same stock. The treatment was given in three periods of five days each, from Monday to Friday inclusive. The living indicators of the didinia were observed for varying periods after such treatment and compared with the normal controls, attention being especially paid to their rate of multiplication and their death. Identical experiments were conducted, only that normal epithelium from the mouse's abdomen was substituted for the cancer tissue in feeding. The dosage of food was accurately gauged. All tissue fed was finely minced and given fresh.

The conclusions drawn from the cancer feeding were: (1) cancer tissue contains something which produces a depressant effect on didinium; (2) it also produces something which produces a stimulating effect. In weak doses, the stimulating factor of a cancer tissue is apparently more noticeable than the depressing effect, or lethal. Larger doses than usual were fatal through all the organisms. In feeding normal epithelium the author found there was no depressant lethal factor in it, but that it caused a stimulation of the organisms. The double dose with cancer feeding gave a mortality of 40 per cent, or more than twice that of the control, 15 per cent; while the double dose with epithelium gave a mortality of 6.6 per cent against 10.6 per cent for the control. With four times as much tissue material in the double dose series as in the half dose, the death-rate with normal epithelium was not raised even to that of the normal controls; hence, the lethal factor cannot be due to an exhaustion from the excess of the stimulating factor.

The author then proposes a theory for the origin of cancer; namely, that cancerous changes may originate in cells from the predominance of the stimulating factor. This, he thinks, may be caused by the autolysis of cells which are being constantly destroyed at the seat of any chronic irritation. He quotes Bullock and Rohdenburg, working in his laboratory, who showed that in rats that had the posterior lobes of their pancreas closely ligated and allowed to remain and autolyze *in situ*, the adjacent parts of the pancreas showed greatly increased mitosis.

H. G. SLOAN.

**Bell, E. T., and Henrici, A. T.: Renal Tumors in the Rabbit.** *J. Cancer Research*, 1916, i, 157.

Bell and Henrici believe that new-growths of any kind are very rare in rabbits. Although the rabbit is very extensively used for laboratory purposes, reports of only 35 tumors were found. Of the recorded tumors 24 were uterine, and 2 were tumors of the kidney. The authors' two neoplasms occurred in adult male rabbits, both having been found on the same afternoon, and although they

state that they have autopsied over 400 rabbits during the last three years, no other tumors have been seen. It was impossible to ascertain the ages of the rabbits or whether or not they were both from the same litter, since animals obtained from different persons had been put into a cage together. In the first case a spherical tumor 1.4 cm. in diameter was found about the center of the outer border of the left kidney. Apparently it was of cortical origin, since it did not involve the medulla. It was sharply marked off from the renal tissue, fairly firm, and whitish gray in color. A thin prolongation of renal capsule covered the tumor. No metastases were found. The second case was very similar to the first, though apparently in a much later stage of development. There were a few small areas that closely resembled the structure of the first tumor, but almost everywhere the cellular masses characteristic of the first tumor had differentiated into solid cords and tubules.

These rabbit tumors thus correspond closely with those neoplasms of the human kidney commonly described as adenosarcomata. The simplest interpretation of their origin is to regard them as having developed from portions of the metanephrogenous tissue which became enclosed in the kidney during its early development but failed to form connections with the collecting tubules. Since no striated muscle was present, they are not comparable, the authors state, to the mixed tumors of the kidney which occur so frequently in children, and which are best explained as derived from portions of the primitive segments.

GEORGE E. BELLBY.

**Tyzzer, E. E.: Tumor Immunity.** *J. Cancer Research*, 1916, i, 125.

In a consideration of tumor immunity it appeared to the author desirable to discuss resistance to spontaneous tumors and to implanted tumor separately. Although results obtained with experimentally implanted tumors have contributed to the biology of tumors, these results cannot be applied directly to spontaneous tumors, and this is especially true with respect to immunity. It has long been recognized that immunity to implanted tumor gives no assurance against the subsequent development of spontaneous tumors.

The results of the experimental investigation of tumors, as well as of clinical and pathological observation, appear to favor the following conception of the nature of tumors and their relationship to the other tissues.

The interreactions of the normal tissues are mutually beneficial so that their relationship is one of symbiosis.

The anomalies and benign growths, while not distinctly harmful, are usually of no benefit to the individual; the relationship is one of commensalism.

The malignant tumors are in many respects parasitic in nature, especially since they develop at the expense of the other tissues of the body. They are so adapted for growth, once they have become estab-



lished, that they seldom arouse any effective resistance on the part of the body. There is some evidence, however, of a local reaction of tissues unfavorable to the growth of many different types of tumors.

Immunity to transplanted tumor is based on foreignness or incompatibility of tumor and host. This holds true whether the tumor or the animal is taken as the constant factor with which to test the other. Although the degree of foreignness is not sufficient for the production of markedly cytotoxic or cytolytic sera, as when different species are employed, it appears probable that an immune body is formed which, in the presence of the antigen — or living tumor — excites an inflammatory reaction in the tissue around the tumor so that the latter is isolated and eventually destroyed.

Both susceptibility and non-susceptibility, or the ability to acquire immunity, are inherited, not as a single unit factor but apparently as a complex of mendelizing factors. Non-susceptibility and susceptibility are apparently based on factor differences, or, in other words, on unlikeness or foreignness. Non-susceptibility may thus depend with one tumor on a difference with respect to new factors, and with another tumor on a difference with respect to many factors. In the comparison of a stock of Japanese waltzing and several stocks of common mice, the non-susceptibility of the latter to a carcinoma, J. w. A., is based on a difference with respect to a large number — probably twelve to fourteen — of independently inherited factors.

Susceptibility is in this material a dominant character, since it is manifested when its factors are present in a single representation, as in the F-1 hybrid. The presence of a single representation of the factors of non-susceptibility in the F-1 hybrid apparently stimulates the growth of the tumor, for its rate of growth is more rapid than in the Japanese waltzing mouse in which the factors of susceptibility are doubly represented.

There are marked differences in the behavior of various tumors on transplantation in given classes of mice. Even tumors arising in homogeneous races show such differences, and this may be attributed to the acquisition of new characteristics by the soma which are manifested in the development of the tumor. The tumor, since it breeds true with respect to these characteristics in the course of artificial propagation, may be regarded as a modification of the somatic tissue which may be termed somatic mutation.

GEORGE E. BEILBY.

**Simon, C.: Cure of a Suppurated Chancrous Bubo in Eight Days Without Apparent Cicatrix, by Filiform Drainage** (Guerison d'un bubon chancrelleux suppuré en huit jours, sans cicatrices apparentes, par le drainage filiforme). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1916, xxxii, 318.

Simon reports a case which ten days after recovery from soft chancre showed ulceration of the glans and a left inguinal adenitis. After about twenty

days' treatment by puncture, etc., with little effect, filiform (thread) drainage of the bubo was instituted. Immediate improvement was observed and in eight days the skin had a normal appearance.

The author hastens to report this case, in which he thinks the method of filiform drainage transformed a long and wearisome disease into a slight ailment, because he thinks that the procedure is of distinct therapeutic value in the treatment of bubo.

W. A. BRENNAN.

**Sequeira, J. H.: Dermatology and Molluscum Fibrosum, with Congenital Morbus Cordis and Kyphosis.** *Proc. Roy. Soc. Med.*, 1916, ix, *Dermatol. Sect.*, 84.

The case is reported of a man, age 21, who resembled a boy of 15, presenting a remarkable soft pendulous growth on the left side of his forehead, as though the skin of his brow and eyebrow had grown many times more redundant and slipped down over his cheek. Illustrations show the improvement in the patient's appearance after a remarkably successful cosmetic operation.

H. G. SLOAN.

**Quillian, G. W.: Acidosis in Surgery.** *Ann. Surg.*, Phila., 1916, lxiii, 385.

The author having observed that the progress of the gangrene of a diabetic's leg varied with the presence or absence of diacetic acid in the urine, he undertook a consideration of the influence of acidosis in a series of cases. The report is based on a study of 138 consecutive major operative cases. Except in a few emergency cases in which glucose and soda aa $\frac{3}{4}$ ss was given as a retention enema a short time before the operation, the following preliminary routine was followed:

Soda bicarbonate  $\frac{3}{4}$ ss in one half glass water T. i. d. one-half hour before meals, was given for two days preceding operation.

Soda bicarbonate and glucose aa $\frac{3}{4}$ ss with water q. s. ad  $\frac{3}{4}$ viii was given as a retention enema, B. i. d. for two days preceding operation. Liquid diet and large quantities of water were given for 48 hours preceding operation, but no buttermilk or egg albumens for 24 hours preceding operation.

Castor oil  $\frac{3}{4}$ ss was given the morning preceding the day of operation. Soap suds enemata were used the night preceding, and the morning of, the operation.

Strontium bromide gr. xxx was given the night preceding operation to insure a good night's rest. Morphia, gr.  $\frac{1}{8}$ , with scopolamine, gr.  $\frac{1}{100}$  was given, one hour preceding gas and ether anæsthetic.

After operation the patients were again given soda bicarbonate  $\frac{3}{4}$ ss in one-half glass of water one-half hour after meals for several days. Water and liquid diet were given as soon as nausea ceased and continued until a light diet was given on the fourth day. An eliminant was given on the third day after the operation.

There was no mortality in the entire series and only five cases of appreciable shock. This has led

the author to believe that acidosis has a dominating influence in surgery, and that by careful pre- and post-operative treatment it may be largely eliminated. From this series, he believes, that post-operative nausea is greatly diminished by the preliminary use of soda bicarbonate. GATEWOOD.

### SERA, VACCINES, AND FERMENTS

**Sellards, A. W., and Minot, G. R.: The Antagonistic Action of Negative Sera upon the Wassermann Reaction.** *J. Med. Research*, 1916, xxxiv, 131.

At the time when the Wassermann reaction was first inaugurated it was assumed that its mechanism was completely understood, i. e., that it conformed precisely to the Bordet-Gengou phenomenon of complement fixation. With the demonstration that a specific antigen was not only unnecessary, but that it was inferior to some of the non-specific antigens, it became evident at once that complement fixation as applied to the diagnosis of syphilis cannot be explained on the basis of the phenomenon of Bordet and Gengou. Not only is the reaction non-specific, but it is now well established that the Wassermann reaction may sometimes occur in certain conditions other than syphilis.

Investigation as to whether normal sera are actively negative, in the sense that they would antagonize a positive serum, forms the basis of this paper. These findings are considered in regard to their practical bearing upon the Wassermann reaction and upon the method of complement fixation in general.

A simple method was adopted in order to test the effect of negative sera upon a positive syphilitic serum. A small amount of negative serum was mixed with the minimal amount of positive serum that would cause complete fixation. A Wassermann reaction was done on this mixture in the usual routine way, after it had been incubated for a short time. From their findings the authors draw the following conclusions:

1. Sera which give a negative reaction with the Wassermann test possess definite inhibitory properties toward positive syphilitic sera, except in certain special cases.

2. The extent of this inhibitory action in negative sera varies widely in different diseases but it is usually comparatively weak. It is easily demonstrable even though it is present only in slight degree.

3. Human sera present three distinct phases in their behavior toward the complement fixation of the Wassermann reaction: (1) negative, (2) positive, and (3) inert action.

These results are explained most readily on the basis of a balanced mechanism. The inhibitory action of negative sera cannot be accounted for solely on the basis of its content in natural sheep amboceptor. GEORGE E. BEILBY.

**Smith, N. R.: The Serotoxin of Jobling.** *J. Lab. & Clin. Med.*, 1916, i, 584.

The production of a serotoxin by treating homologous and heterologous sera with chloroform and

ether as reported by Jobling has found wide acceptance among workers in the field of anaphylatoxins and is incorporated in the literature of the subject alongside the earlier pioneer work of Richet, Bordet, Friedberger, Nathan, and others. Jobling maintains that the ferment action of the serum is held in abeyance normally by an unsaturated lipoidal antitryptic substance, the removal of which by lipid solvents permits autolysis of serum proteins, thereby forming a poison, which is in all probability identical with Vaughan's protein split product. Some work was under way in his laboratory in which splitting of germ substance by sera was the desired end.

In the light of Jobling's work it seemed to the author reasonable to assume that the splitting action of the sera could be greatly increased and accelerated by shaking out the sera with chloroform before incubation with the germ substance. Therefore rabbit serum was shaken with one-tenth its volume of chloroform four minutes, then centrifuged at 8,000 R. P. M. for ten minutes and the supernatant serum carefully pipetted off from a precipitate that, upon centrifugation, was interposed between the chloroform on the bottom and the serum above. As a matter of routine, controls were made by testing the action of the serum on guinea pigs before incubation with the germ substance. As high as 9 ccm. of the normal untreated serum had been injected without effect, but since the M.L.D. of serum and germ substance after incubation was known by trial to be 3 ccm. or less, the control injection of the normal serum was usually limited to 3 ccm. But upon the injection of the chloroformed serum in 3 ccm. quantities as a control, that is, without incubation with germ substance, the pigs died instantly. Reduction of the dose to one cubic centimeter still produced death in most cases, and always a marked prostration.

The character of the deaths, together with the autopsy findings, clearly indicated atypical anaphylaxis and pointed strongly to the residual chloroform in the serum as the toxic agent.

Smith concludes that the intravenous injection of high dilutions of chloroform may cause sudden death in guinea pigs, and that when blood serum has been shaken with chloroform the complete removal of the chloroform is difficult. The toxicity of the serum falls with the completeness of the removal of the chloroform. Death in guinea pigs caused by the intravenous injection of serum which has been shaken with chloroform is often at least, he states, not typical of anaphylactic shock. Serum when shaken without chloroform may cause typical anaphylactic shock with death and typical autopsy findings. GEORGE E. BEILBY.

**Hektoen, L.: Vaccine Treatment.** *J. Am. M. Ass.* 1916, lvi, 1591.

The general results so far from the routine use of commercial vaccines, polyvalent and mixed, have no value as evidence for or against curative useful-



ness of vaccine treatment, and hence no value, either, with respect to the soundness of the theory on which vaccine treatment primarily has been developed.

In subacute and chronic localized infections, the results appear to indicate that specific vaccines properly and skillfully used have value, quite likely because they increase the production of specific antibodies, as demanded by the theory, but probably also because they stimulate leucocytic and other activities.

In typhoid fever and possibly also in other infectious diseases, the intravenous injection of specific vaccines and also of other substances may induce crisis and prompt recovery. The mechanism of this action is not fully understood, but as it involves something more than, or different from, specific stimulation of the production of antibodies, it cannot be interpreted in terms of the current conception of the action of vaccines. We are entering, therefore, upon a new and interesting development in the study and treatment of infectious diseases.

EDWARD L. CORNELL.

## BLOOD

**Della Valle, L.: Suppurative Hæmatoma of the Iliac Fossa** (*Ematomi suppurati della fossa iliaca*). *Riforma med.*, 1916, xxxii, 90.

The author says that while almost every variety of hæmatoma has been the object of very close study and detailed description, deep hæmatomata of the iliac fossa do not get the amount of attention which their importance demands, particularly on account of their complications in suppurations. His article is therefore devoted to a detailed description of the pathologic anatomy, symptoms, diagnosis, and treatment of this condition.

His study is based on clinical data obtained in hospital cases observed and operated upon by him within the past few years.

In the treatment of these suppurative hæmatomata, it must be noted that the pus forms a vast subperitoneal focus which is limited in front by the fascia iliaca and beneath by the crural arcade. To open this, therefore, the incision must be horizontal and above the arcade in a point indicated by the fluctuation while avoiding the epigastric artery. The skin, subcutaneous fascia, the aponeurosis of the oblique muscle, the transverse, and the fascia transversalis must be cut through before the pus focus is reached. A hæmatoma of large dimensions may more conveniently be evacuated by a lumbar incision.

W. A. BRENNAN.

**Kleiner, I. S.: The Disappearance of Dextrose from the Blood After Intravenous Injection.** *J. Exp. Med.*, 1916, xxiii, 507.

The chief purpose of the author's present work was to study the disappearance of sugar from the blood under various conditions. In order to obtain a basis of comparison a series of experiments

was first carried out in which dextrose was injected into normal animals. These experiments brought up the question as to whether the passage of sugar from the blood into the tissues was a vital process and led to a series of experiments in which dextrose was injected into dead animals. These experiments yielded the following results:

1. As has been found by other investigators, when a large amount of dextrose is injected intravenously into a normal dog it disappears from the circulating blood in about 90 minutes after the end of the injection. Varying amounts — an average of 60 per cent — are excreted in the urine.

2. Even in nephrectomized animals the same quantity will leave the circulation in the same length of time as in normal animals.

3. This phenomenon seems to be, at least to a great extent, independent of vital processes, since dextrose, after intravenous injection into dead animals, is found to leave the blood rapidly.

4. The phenomenon is independent of the important abdominal organs, for it also occurs in animals (living or dead) in which the aorta and inferior vena cava have been ligated near the diaphragm, thus abolishing most of the circulation posterior to the diaphragm.

5. The fact that a considerable amount of the sugar passes from the circulation into the surrounding tissues was established by finding an increase in the carbohydrates of the muscle tissue. This was done in the case of the living anterior animals and in the whole of anterior dead animals. In most of these experiments there was also evidence of the formation of polysaccharides in the muscle tissue.

GEORGE E. BEILBY.

**Willmoth, A. D.: Some of the Uses and Abuses of Normal Saline Solution.** *Am. J. Surg.*, 1916, xxx, 147.

The author reviews the history of transfusion with its many difficulties and uncertainties, dating as far back as 1492, when Pope Innocent VIII was given intravenous transfusion of blood, the donors being three boys. This effort was like many subsequently, unsuccessful, and not until the middle of the seventeenth century did transfusion become a recognized surgical procedure. In 1666 Lower wrote the first detailed account of transfusion, followed soon afterward by Denys of France with three successful cases. It being little more than a curious experiment, after several unsuccessful efforts it was abandoned until the nineteenth century.

An attempt was made to overcome unfavorable results by using something that would supply the volume of blood, yet be easier to obtain and safer to administer from a surgical viewpoint, and would subject the patient to no danger of disease existing in the donor. Milk and other albuminous fluids were tried and soon abandoned.

Isolated cases occurred earlier, but Schwartz in 1881 gave the first methodical description of saline

infusion, this being the first reliable information concerning the use of fluid to take the place of blood. Since more has been learned of the various constituents of the blood, other inorganic salts, such as potassium and calcium, were added to the sodium chloride solution, Ringer and Locke's solutions, whose specific gravity should be 1.009, being most often used.

The fact that sodium chloride is found in liberal quantities in most of our food possibly accounts for its indiscriminate use in surgery. It is changed by lactic acid into sodium lactate thereby setting free hydrochloric acid. It is commonly believed that the kidney glomeruli have no limitations for excreting water and the chlorides.

The question of the use of salt solution has not been elaborately studied. Its uses are: (1) to replenish the circulation, (2) to refill the blood-vessels, thereby permitting the mechanical acts of the circulation to proceed, (3) in shock with adrenalin 1:10,000 to 1:20,000 to stimulate the heart and blood-vessels, so that the blood accumulated in the large vessels is again placed in circulation, (4) to stimulate the action of the kidney and skin, (5) its use in sepsis.

Salt solution may be used in the following ways; (1) intravenously, especially after amputation and before tying the vessels, (2) intra-arterially, (3) by hypodermoclysis, (4) by proctoclysis, (5) by leaving a quantity in the abdomen after celiotomy. It should be used at a temperature of 110 to 120° F. This temperature is perfectly safe, since globulin coagulates at 158° F. and serum albumin at 162° F., and experimentally 165° F. has been well borne by the dog. The heat acts as a stimulant to both heart and blood-vessels, a point to be remembered by the obstetrician.

For the relief of shock it should be used in small quantities by the intravenous method at a temperature of 120° F., frequently repeated, rather than in one or more large injections, thereby avoiding overwhelming the heart. The conditions to be met are in striking contrast to those resulting from hæmorrhage, where death results from absolute loss of blood, not enough remaining in the vessels to sustain vital functions even though it could be kept in active circulation and death results from mechanical interference, not enough blood remaining in the vessels to enable the heart and elastic arteries to transmit the force of the heart contractions to distant portions of the body. As a consequence the blood fails to complete the circuit and all centers suffer from anæmia carried to the point of death. Experiments have shown this would not occur, even though one-half or two-thirds of the total volume of blood be lost, provided the circulation be maintained by supplying a fluid in place of blood.

In the preparation and use of saline in any case, much depends upon the strength and composition of the solution, also the technique of its administration. Too little salt causes the corpuscles to swell and lose their hæmoglobin, or completely destroys

them; too much causes them to shrink. To insure correctness tablets should be used or stock solution kept that has been prepared by actual weight. This solution should be prepared by sterilizing by fractional methods.

In private homes water from the teakettle is sterile enough for practical purposes; to this add a heaping teaspoonful of salt and four drachms of glucose to the quart, this being accurate enough save for intra-arterial and intravenous use. As much as 500 ccm. can be easily introduced under each mammary gland or into the cellular tissue at a favorable point, such as between the shoulders or over the abdomen. In the intravenous method difficulty is experienced in trying to locate partially collapsed vessels, in using too sharp a needle thereby piercing the opposite wall of the vessel, and by too rapid introduction. Not more than one ounce per minute should be used.

Abuses: Under no circumstances should saline be used in apoplexy, arteriosclerosis, pulmonary œdema, dilated right heart, threatened sudden death, or collapse from chloroform or other narcosis, the last two requiring more rapid measures. It should not be used in uræmia. No more than fifty grains of salt should be used to each one hundred pounds of body weight. If elimination be insufficiently rapid, some degree of dropsy and œdema must occur, and is usually in the form of œdema of the lungs; especially is this likely to occur in nephritic patients.

C. C. MAPES.

**Krida, A.: The Indications for Blood-Transfusion.**  
*Albany M. Ann.*, 1916, xxxvii, 161.

The author describes some of the functions and properties of the blood. The indications for transfusion, according to their pathologic physiology, are classified as follows:

1. Conditions in which there is a deficiency in the quantity of the circulating fluid.
2. Conditions in which there is a deficiency of the respiratory elements sufficient in degree to impair the integrity of vital organs.
3. Conditions which are accompanied by disorders in the process of coagulation — increased susceptibility to hæmorrhage.
4. Conditions in which the body has been invaded by infection and its products.

He concludes that blood-transfusion is indicated in the following conditions:

1. Massive hæmorrhage.
2. Marked secondary anæmias, either as a palliative measure or as a pre-operative measure.
3. Essential anæmias.
4. Blood dyscrasias, if fresh human serum injections or thrombin is ineffective.
5. Chronic localized infections of demonstrable etiology, not amenable to other treatment. Immunized blood should of course be used in these cases.

No blood-transfusion should be undertaken with-



out first making agglutination or hæmolytic tests of the patient's and donor's blood.

LUCIAN H. LANDRY.

**Minot, G. R.: Methods of Testing Donors for Transfusion of Blood.** *Boston M. & S. J.*, 1916, clxxiv, 667.

The author reaches the following conclusions after a full discussion of the subject:

A donor for transfusion of blood should not only be healthy, but should belong to the same iso-agglutination group as the recipient.

Simple and quick methods for testing this have been described. What these tests show *in vitro* can be taken as reliable evidence as to what may happen *in vivo*, so far as agglutination and hæmolytic are concerned.

Even when donor and patient belong to the same iso-agglutination group, there may occur, however, after transfusion, reactions of unknown nature, which are probably of not so severe or serious a nature as hæmolytic.

Agglutination often does not occur *in vivo* and if it does, it does not always cause a severe reaction because of the following three factors: (1) interference with agglutination by an excess of non-agglutinable cells; (2) absorption of the agglutinin by the agglutinable cells; (3) the degree of concentration of the agglutinin.

Hæmolytic does not always occur *in vivo*, when donor and recipient belong to different iso-agglutination groups, because only about 20 per cent of sera that are agglutinative are hæmolytic. Hæmolytic, however, never occurs without being preceded by or associated with agglutination.

If hæmolytic are present in the plasma of the donor or recipient, or both, hæmolytic may not occur, or may cause but a slight reaction *in vivo*, because of the following factors and their quantitative relation to each other: (1) concentration of the hæmolytic, concentration of the anti-hæmolytic, and a certain degree of absorption of the hæmolytic by the hæmolyzable cells. In discussing these factors, it is pointed out that in certain instances the knowledge of the strength of the anti-hæmolytic might be of value.

LUCIAN H. LANDRY.

**Singleton, A. O.: A Reliable Method of Blood Transfusion.** *South. M. J.*, 1916, ix, 439.

Singleton reports a method of transfusion successfully used in ten cases.

His apparatus consists of a graduated glass container with the bottom drawn out into two cannula-like processes for connection with the veins and with the top connected by a rubber tube with a pair of pressure bottles.

The container is sterilized, dried, and coated with paraffin and connected with the veins of the donor and the recipient respectively, following the usual technique except that the veins are flushed out with citrate solution prior to the insertion of the cannula.

About 50 ccm. of a 1.5 per cent sodium citrate solution is poured into the container, a tourniquet is tightened around the donor's arm, and the clamp is removed from his vein. The pressure bottle is immediately lowered by an assistant, producing a negative pressure in the container, and the blood rushes in. The amount obtained depends upon the rapidity of its flow, the slower the flow the smaller is the amount of blood obtained. Usually about 200 ccm. can be obtained at a time. Having secured this amount in the container the pressure bottle is immediately raised and the blood forced into the recipient's vein, the vein of the donor being pressed between the thumb and finger and the clamp removed from the recipient's vein. About 50 ccm. should be left in the container and the process repeated. It is essential to keep the blood moving.

Although this method is not simple it can be relied upon to transfuse any quantity of blood desired with perfect safety to the patient, and the author finds that it gives a pressure that is more uniform and more easily controlled than that obtained by the use of a syringe.

Of the 10 cases transfused, 3 were for pellagra, 2 for pernicious anæmia, 1 for puerperal sepsis, 1 for pernicious malaria, and 3 for hæmorrhage. The three cases of hæmorrhage showed rapid improvement and were cured; the case of pernicious malaria showed marked improvement; the other cases died. In one of the cases of pernicious anæmia an unrelated person was the donor in a second transfusion. On the second day following this transfusion the patient developed a temperature of 101° which persisted for several days, and he suffered some slight hæmorrhage from the nose.

The author emphasizes the importance of making Wassermann, hæmolytic, and agglutinin tests with the blood of the donor previous to the transfusion, but regards the blood of an immediate relative as perfectly compatible in the greater percentage of cases.

J. W. TURNER.

**Peterson, E. W.: Results from Blood-Transfusion in the Treatment of Severe Post-hæmorrhagic Anæmia and the Hæmorrhagic Diseases.** *J. Am. M. Ass.*, 1916, lvi, 1291.

Peterson studied the results of blood-transfusion in severe hæmorrhagic anæmia and the hæmorrhagic diseases. His conclusions, based on the literature and a series of nine cases reported in detail, are as follows:

Transfusion of blood, intramuscular injections of whole blood, and intravenous and subcutaneous injections of homologous serum are the most efficient measures and are of value, in the order named, in the treatment of hæmorrhage and the hæmorrhagic diseases.

In severe cases of acute post-hæmorrhagic anæmia, blood-transfusion is the best, and at times the only efficient, means of resuscitating a dying patient. In chronic post-hæmorrhagic anæmia, provided the cause of the bleeding is removed or

remedied, no other measures will compare in efficiency with transfused blood in producing hæmatopoietic stimulation.

In pathologic hæmorrhage, transfusion of blood has on numerous occasions proved effective after the failure of all other measures. It should be resorted to, then, in those cases which do not respond promptly to the simpler methods of treatment.

A. EHRENFRIED.

**Barnes, F. R.; and Slocum, M. A.: Direct Blood-Transfusion with the Kimpton-Brown Tubes.** *Am. J. M. Sc.*, 1916, cli, 727.

Of the 9 cases reported by the authors, 8 suffered from hæmorrhage and were practically moribund when transfused; the other suffered from sepsis. One of the cases of hæmorrhage was complicated by peritonitis and another by a large carcinomatous mass at the head of the pancreas.

The only difficulty experienced in the use of the Kimpton-Brown tubes was in keeping the stoppers in when pressure was applied to force the blood into the recipient's vein. This difficulty was avoided after the first transfusions by pressing the palm of the gloved hand firmly against the top of the tube while it was being emptied, the stoppers being discarded altogether. With this technique the tubes proved entirely satisfactory.

Six of the patients showed immediate and marked improvement in the general condition and as indicated by the increase in the hæmoglobin estimation and in the red-cell count after the transfusion. The patients who died were those suffering from sepsis and one suffering from carcinoma.

The authors were impressed by the value and simplicity of the Kimpton-Brown method of transfusion. They emphasize the value of transfusion in all cases suffering from grave anæmia, particularly that due to hæmorrhage, but consider it futile in cases of sepsis.

They found it best to have the donor and recipient so far apart that neither would in any way disturb the other nor interfere with work upon the other.

J. W. TURNER.

#### BLOOD AND LYMPH VESSELS

**Morton, C. A.: An Unusual Form of Gunshot Arteriovenous Aneurism in Which the Sac was Situated on the Side Opposite to the Vein.** *Lancet*, Lond., 1916, cxc, 557.

In the ordinary form of arteriovenous aneurism the aneurismal sac lies between the artery and vein and the communication between the artery and vein is through the sac. In the case which is now recorded there was a communication between the artery and vein, due to the passage of a piece of projectile through them, and on the side of the artery opposite to the communication, where the portion of projectile had passed out of the artery, was an aneurismal sac. Where the portion of projectile had penetrated the vein—i.e., in the side of the vein

farthest from the artery—was what may be called a venous aneurism; i.e., a cavity in the tissues containing old blood-clot, communicating with the vein. The piece of metal evidently passed through the vein and artery from below upward.

This is a very rare type of arteriovenous aneurism, there being only one similar case in the series of 50 gunshot aneurisms reported in the *British Journal of Surgery* of October, 1915. J. H. SKILES.

**Fuller, E. B.: Notes on a Case of Aneurism of the Dorsalis Pedis Artery.** *So. African M. Rec.*, 1916, xiv, 135.

A male, aged 50, complained of a painful swelling on the back of his left foot, which had appeared a month previous and gradually increased in size. He denied any history of injury to the foot.

On the back of the left foot, just below the annular ligament in the line of the dorsalis pedis artery, was a pulsating swelling about the size of a small hen's egg. The skin over the swelling was glazed and reddened and there was considerable tenderness and pain. The appearance of the swelling, apart from the evident pulsation, gave the impression of an abscess about to burst. Pressure on the artery above stopped the pulsation in the tumor. The swelling was diagnosed as an aneurism and it was decided to excise it.

The artery was ligated above and below, and the sac, which contained a considerable amount of blood-clot, was excised. The aneurism was a curious mixture of the fusiform and sacular. At the upper part the artery seemed to have gradually dilated into a fusiform channel and then suddenly a sac was formed in its course; doubtless from the more complete rupture or stretching of the coats of the vessel.

The patient made an uninterrupted recovery, the wound healing by first intention. It may be mentioned that the patient's arteries were atheromatous and he had a double aortic murmur.

EDWARD L. CORNELL.

**Neuhof, S.: Diagnosis, Symptomatology, and Therapy of Dilatation Aneurisms of the Descending Thoracic Aorta.** *Am. J. M. Sc.*, 1916, cli, 715.

The author recognizes dilatation aneurisms of the descending thoracic aorta as a distinct clinical entity presenting characteristic symptoms, and reports a number of illustrative cases.

The most constant sign is an impact area to the left of the sternum at its middle third. By placing the eye on a level with the chest, a distinct heaving area, distinguishable from that of the apex and occupying the lower left sternal intercostal spaces, can often be detected. A sense of impact is also received when the bell of the stethoscope is placed over this area. This impact sensation may be well detected by snugly fitting two or three fingers in the left middle interspaces near the sternum. Occasionally a systolic thrill is palpable. In some



instances it is possible to detect a difference between the time of the apex impact and that in the left middle interspaces near the sternum. This is best done by placing one finger over the apex and another over the left sternal border. These signs are made more evident by having the patient hold his breath.

There is usually a rough systolic murmur over the dilated aortal area; the second sound has a liquid rather than an accentuated tone and is prolonged so as to occupy the entire diastole or is followed by a diastolic murmur of varying intensity. Pain, when present, is substernal, or may be referred to different parts of the chest, neck, jaws, or head, and is most apt to occur after exercise. These signs are usually associated with some evidence of cardiac decompensation which may not, however, be a marked clinical feature.

The impact to the left of the sternum and the characteristic murmurs suggest the condition, but it is absolutely essential to have roentgenograms or a fluoroscopic examination to clinch the diagnosis. The condition is a leutic manifestation and in all cases antisyphilitic medication is indicated.

J. W. TURNER.

**Bernheim, B. M.: Choice of Operation in the Cure of Aneurisms of the Extremity.** *Interst. M. J.*, 1916, xxiii, 326.

As so many surgeons are poorly prepared to successfully cope with aneurisms, Bernheim offers several suggestions to assist in making a proper choice of procedure in aneurisms of the extremity.

The test devised by Moskowitz is recommended. This consists of rendering the leg bloodless by an elastic bandage applied to the upper pole of the aneurism; the blood stream is then shut off in the parent vessel by a pad in Hunter's canal. When aneurism is stilled the elastic bandage is quickly removed and the returning hyperæmic wave carefully noted. Should the blush quickly spread throughout the leg, compensatory circulation is assured and the parent artery may be occluded. Should the leg remain pallid, collateral circulation is absent or slight and occlusion contra-indicated.

Again, normal pulsation of the arteries of the foot show an absence of compensatory circulation while a lack of pulse practically assures sufficient collateral blood supply.

A case in point is given in which an aneurism of known syphilitic origin and of rapid growth was found in the popliteal space. There was pulsation of the arteries in the foot and the Moskowitz test negative. Therefore, after removal of the aneurismic sac the gap was bridged by a venous transplant from the saphenous vein, care being taken to reverse the vein so that the valves faced the foot. Immediate resumption of the blood stream occurred, the arteries of the foot pulsated normally, and the troublesome symptoms of œdema and numbness entirely disappeared within a short time.

P. M. CHASE.

**Makins, G.: The Importance of Auscultation in the Diagnosis of the Vascular Injuries Accompanying Gunshot Wounds.** *Lancet*, Lond., 1916, cxc, 812.

The author reports his experience in dealing with injuries of the blood-vessels during the war.

He lays stress on the fact that in any case of swelling of the limbs in connection with gunshot wounds, the stethoscope affords a ready means of establishing a diagnosis if there is an aneurism present. The point at which the bruit is loudest and highest pitched will show where the lesion is situated. Aneurisms involving either the arteries, or the arteries and veins, show in addition to the local bruit at their site, also a transmitted bruit in the region of the heart.

The author has not met with any instances in which a pure arterial murmur in connection with the wounded vessels of the arm was audible in the heart, but he has noticed it in a carotid aneurism, and has frequently seen it in connection with the femoral vessels. These transmitted bruits show a temporary persistence. The heart at first is markedly affected, enlarged, and with an increased rate; after a few weeks it is able to compensate, at which time the bruit disappears, unless closely associated with the heart. He thinks that the cardiac disturbance is probably to be explained by the sudden alteration in the force required for the maintenance of general circulation under the altered conditions.

H. G. SLOAN.

**Elsberg, C. A.: The Surgical Significance and Operative Treatment of Enlarged and Varicose Veins of the Spinal Cord.** *Am. J. M. Sc.*, 1916, cli, 642.

Among vascular lesions of the spinal cord, such as amnesia, angioma, etc., enlargement or tortuosity of the superficial veins, although relatively common, have received little attention in the literature. When the posterior spinal veins are compressed by an extramedullary neoplasm, the veins for some distance below (one or both of the two main trunks) appear engorged and sometimes more tortuous than normal. The appearance on exposure of the cord is quite different from the pinkish hyperæmic look of the distended arteries and veins in intradural inflammatory processes.

The operator should recognize the significance of these enlarged and tortuous veins. A local enlargement or varicosity may take place causing local spinal symptoms, relievable by operation. Cases have been reported of varices or "hæmorrhoids of the spinal pia," the symptoms of which are usually those of a transverse lesion.

In several of the author's six cases the enlarged vein accompanied one of the spinal roots to the dural opening. The abnormalities were of various kinds, the enlarged veins usually pressing upon spinal roots. These were in the dorsal region in five; lumbosacral in one. The condition was always unilateral, proving it not to be due to the operation



itself. In one case a tuberculoma of the cord was present. One case examined microscopically showed hyaline degeneration of the vessel walls. The author's technique in operative treatment consists in the removal of as large a part as possible of the enlarged vein by raising and ligating with fine silk in an aneurism needle. As the veins are very fragile great care is necessary.

The results were improvement or relief in all but two cases which had spastic paraplegia of long standing. The author is uncertain as to whether the venous condition is a cause or effect of spinal-cord disease, and thinks the operative result may be due to the decompression by laminectomy.

HORACE BINNEY.

### POISONS

**Tullidge, E. K.: Tetanus; a Surgical Complication in the Present War.** *N. Y. M. J.*, 1916, ciii, 1022.

Tetanus is a very common complication in the present war. There is usually a mixed infection present. The anaerobic nature of the organism is especially suited to the ragged and deep character of the majority of the wounds. The filthy condition of the soldiers, especially their contamination with ground which has been fertilized for ages, predisposes them to inoculation with the tetanus bacillus whenever a wound is sustained.

The usually prodromal symptoms are stiffness and pain in the muscles, especially those of the head and neck. These steadily increase in severity until convulsions ensue.

The use of antitoxin is highly recommended as a curative measure. Enormous doses are used by the author, from 10,000 to 160,000 units being given. The local treatment of the wound is important and the liberal use of tincture of iodine seems to be beneficial.

J. H. SKILES.

**MacConkey, A. T., and Zilva, S. S.: Iodine in Tetanus.** *Brit. M. J.*, 1916, i, 411.

It is a well-established fact that iodine when mixed with tetanus toxin possesses the power of rendering the latter non-toxic. The longer the period of contact between the iodine and the toxin before injection the less toxic the latter becomes. A mixture of equal parts of iodine and tetanus toxin also possesses the power to produce immunity to subsequent injections of the toxin.

These facts suggested the thought that iodine might be of value in curing tetanus, and a series of experiments was carried out with that in view. The conclusions reached are that iodine when injected subcutaneously has no effect upon tetanus toxin which has also been injected subcutaneously in a different place. The course of tetanus can not be favorably influenced by injections of iodine alone, nor does the latter seem to have any effect in enhancing the power of antitetanic serum. Iodine can only be of use when applied to the infected focus, so that it comes into direct contact with the toxin before absorption.

E. K. ARMSTRONG.

**Robertson, H. E.: The Prophylactic Use of Tetanus Antitoxin.** *Am. J. M. Sc.*, 1916, cli, 668.

Robertson, in reviewing the prophylactic use of tetanus antitoxins, explains its failure in some cases by pointing out the rapid formation and absorption of tetanus toxin, associated with the extreme rapidity with which it is bound to the nerve-cells, when it cannot be neutralized. The absorption of the antitoxin into the blood is relatively slow, allowing time for the more rapidly formed toxin to gain such headway as to produce fatal results.

Another reason for the failure in some cases is the short duration of immunity conferred by the prophylactic dose, usually fifteen to twenty days. When for one reason or another the formation of the toxin is delayed or not absorbed (delayed tetanus), the period of protection has passed and the disease develops. In active surgical interference in wounds of patients that have remained free from the symptoms for many days or weeks, active symptoms of tetanus will suddenly follow a reopening of the wound or an amputation. Consequently when such interference is contemplated, a second injection of antitoxin should be administered.

Other of his conclusions are that the most ideal and perfect protection against tetanus is the protection of active immunity, produced before infection has occurred. This admittedly is not practical, but deserves further consideration and research.

In a large majority of cases the subcutaneous injection of twenty units immediately after the injury will prevent with certainty the occurrence of tetanus. The delay of a few hours in making the injection may mean the loss of life.

Local applications of fluid antitoxin on wounds are efficacious but unnecessarily wasteful and not always practical.

In cases where injections cannot readily be made, especially in war time, the immediate application to the wound of dried antitoxin tampons moistened by clean fluid may be used as a temporary substitute until fluid antitoxin can be injected.

D. L. DESPARD.

**Everidge, J.: Mental Symptoms Complicating a Case of Acute Tetanus During Treatment by Carbolic Injections.** *Brit. M. J.*, 1916, i, 443.

Eleven days after having received a severe injury to the lower extremities, the patient developed tetanus, which rapidly grew worse. Antitetanic serum was given, together with 1 ccm. of 1:20 carbolic acid solution subcutaneously every four hours. For a week the spasms were so severe that the patient was given large doses of morphine, chloral, and bromides. At the end of this time the spasms became less marked but the mental condition showed a great change, a condition resembling delirium tremens developing. This lasted five days, during which time restraint was necessary. Incontinence of urine and feces was present also. Chloral and bromides had no effect but paralde-



hyde had a quieting effect. A relapse occurred with more incontinence and it was a month after the development of the tetanus before the patient's mental state once more approximated the normal.

The author wonders what the connection is between the carbolic acid injections and the condition. One ccm. of the 1:20 solution was given every four hours over a period of about 12 days.

E. K. ARMSTRONG.

**Dean, H. R., and Mouat, T. B.: Bacteria of Gangrenous Wounds.** *J. Roy. Army M. Corps*, 1916, April, 349.

The authors give an interesting account of a prolonged study of the bacteria in gangrenous wounds at the Third Northern General Hospital which has brought out points of great interest to the bacteriologists and surgeons as shown in the following summary:

1. The series comprises 18 cases of gangrenous wounds of which 3 only were fatal. Included in this total are 4 cases of tetanus, 1 of which was fatal, and 4 cases of gas gangrene, 2 of which were fatal. Among the 18 cases *bacillus oedematis maligni* was found in 15, and *bacillus aerogenes capsulatus* in 13.

2. *Bacillus aerogenes capsulatus* and *bacillus oedematis maligni* are apparently possessed of powerful enzymes. The former is peculiarly able to attack carbohydrates, the latter proteins. Dorset's egg medium is an admirable medium for both microorganisms.

3. The shape, size, staining reactions, and capacity for spore formation of these bacilli are profoundly influenced by the nature of the culture medium.

4. On Dorset's egg-medium the majority of the bacilli are typical in shape, uniform in size, and are gram-positive. On media which contain a carbohydrate, from which the bacilli can form acid, growth is at first rapid and vigorous, but after a few days the bacilli become atypical in appearance, vary greatly in size, and the majority are gram-negative.

5. *Bacillus aerogenes capsulatus* forms spores on Dorset's egg-medium and inspissated serum, but not on media in which an acid reaction is produced. *Bacillus oedematis maligni* forms spores less readily in acid media.

6. The presence of *bacillus aerogenes capsulatus* and *bacillus oedematis maligni* is not necessarily associated with the development of gas in the tissues.

7. *Bacillus oedematis maligni* and *bacillus aerogenes capsulatus* are essentially saprophytes. They have little or no power to multiply in living tissue. In dead tissue they grow rapidly and produce poisonous substances, by which the adjacent living tissue is destroyed and rendered a suitable medium for the further multiplication of these bacilli.

8. The *bacillus tetani* was not found in films made from the discharge in any one of the six cases in this series in which it was present.

9. The recognition of *bacillus tetani* by purely

microscopical methods is complicated by the fact that slender gram-positive rods bearing an absolutely terminal spore may be occasionally found in pure cultures of *bacillus oedematis maligni* and *bacillus aerogenes capsulatus*. Moreover, pure cultures of tetanus bacilli, especially cultures on egg-medium, often contain many atypical forms.

10. If broth is inoculated with material from the wound in a case of tetanus, and incubated under anaerobic conditions, the presence of *bacillus tetani* can often be satisfactorily demonstrated by animal inoculation. Such a broth culture should be examined at intervals, and two or three weeks may elapse before *bacillus tetani* can be demonstrated.

11. The presence of *bacillus tetani* was demonstrated in the discharge from the wounds of two patients who did not develop signs of tetanus. Both had received injections of antitetanus serum.

12. The discovery of *bacillus tetani* in the wounds of a patient who had not developed tetanus would obviously be an indication for one or more prophylactic injections of antitetanic serum. But the practical utility of such a procedure is limited by the difficulty and delay which attend the bacteriological recognition of this bacillus. Now *bacillus tetani* belongs to the same group of anaerobic bacteria as *bacillus aerogenes capsulatus* and *bacillus oedematis maligni*. All three have probably a common source, and the conditions favorable to their growth within a wound are probably identical. The demonstration of either *bacillus oedematis maligni* or *bacillus aerogenes capsulatus* is a relatively simple matter and does not involve much delay. The discovery of either of these bacilli might with advantage be followed by a prophylactic injection of antitetanic serum.

13. A prophylactic injection of antitetanic serum should be given before any considerable operation is performed on a patient with a gangrenous wound.

L. A. LAGARDE.

## SURGICAL THERAPEUTICS

**Rowlands, R. P.: Time in Surgery.** *Brit. M. J.*, 1916, i, 549.

The author makes an appeal for the conservation of time in connection with surgery.

Often a great deal of time is lost in delayed diagnoses or operation is deferred beyond the safety point. A "wait and see" policy often changes the course of the convalescence. Two cases of appendicitis are reported to illustrate this point.

Avoidance of waste of time at operations is extremely important. This can be accomplished (1) by making all possible preparations and calculations beforehand, in the way of preparation of the patient, instruments, threading sutures upon needles, etc., before the anæsthetic is begun; (2) by improving and simplifying the technique of the operation in every possible way; (3) by concentrating the full attention upon the operation.

J. H. SKILES.

## SURGICAL ANATOMY

**Horrox, G.: Studies on the Pineal Gland.** *Arch. Int. Med.*, 1916, xvii, 607.

Attention is directed to the fact that the clinical aspects of pineal tumors have been abundantly discussed since 1909, when Frankl-Hochwart suggested the possibility of a pathognomonic syndrome. Marburg especially has developed the subject, emphasizing the association of adiposity, which he regards as an indication of overfunctioning of the gland. The salient factors have been gleaned from reports of about 70 cases of tumors of the gland. Of this number only 22 occurred before the age of puberty and these, therefore, represent the source of evidence of that special train of symptoms, which have come to be associated with pineal disorders, namely, premature development in the realm of both primary and secondary sexual characters. In several of these cases, moreover, principally in the earlier reported ones, the case records are insufficient or wanting, and in five others no reference is made to the sex organs, although certain metabolic symptoms are noted. Of these, adiposity, drowsiness, and polyuria are the most frequent, suggesting at once an implication of the pituitary, but the imperfect records preclude any possibility of settling this question at present. Regarding the other cases, of which there are about 10, all but one occurred in young boys between the ages of 2 and 12 years. The exception is Marburg's case, a girl 9 years old.

The author reports three cases from the surgical service of the Peter Bent Brigham Hospital, all of which showed precocious adolescence and overgrowth. A study of the diseases to which the pineal body is subject has been confined almost exclusively to the different varieties of tumors which have been found to arise either from the gland itself or from those structures which lie in its immediate neighborhood and therefore involve the pineal secondarily. Very rarely conditions other than tumor have been mentioned in connection with pineal pathology, but these play an inconspicuous and perhaps dubious part in this chapter of the study of the gland.

From the author's study he gathered the impression that from what is known of the physiology of the normal gland, as well as from the results of Foa's and his own experimental observations, that sexual ripening occurs when the pineal ceases to be functionally active, or when it is removed, and on this basis he inclines to the belief that the tumor in most of these clinical cases is associated with an inhibition of the normal products of pineal secretion. If this were really the case, however, one would suppose that glandular feeding would postpone adolescence, but from the observations of Dana and McCord the reverse seems to occur. The author's own studies in this direction with the feeding of young guinea pigs and rats were not conclusive, and it is a matter which deserves further study. Briefly the author gives the following summary of his work.

1. Extirpation of the pineal in young chickens and lower animals tends to hasten normal maturity.

2. Tumors of the pineal gland in children, occurring before the age of puberty, usually give rise to a syndrome characterized by precocious adolescence.

3. Feeding the gland substance to young animals is said to have the same effect as extirpation, but the observations are somewhat inconclusive.

A report of three cases of supposed pineal tumor, one of which was confirmed by necropsy, is offered as a further contribution to the study of this gland.

GEORGE E. BEILBY.

**Vecchi, A.: Critical Observations and Experimental Researches on the Regeneration and Neoformation of Lymph-Glands** (Osservazioni critiche e ricerche sperimentali su la rigenerazione e la neoformazione delle linfoghiandole). *Clin. chir.*, Milano, 1916, No. 1, 90.

The author's experiments were carried out on dogs and rabbits. The basis for the subsequent conclusions were dependent upon the following problems: Could a totally enucleated lymph-gland regenerate? Could a partially resected lymph-gland regenerate? Could there exist, independent of any damaging operation, a neoformation of lymph-glands, and could their number be increased in a given region? The conclusions are as follows:

1. After the enucleation of a lymph-gland there is no regeneration, but the formation of a new lymph-gland of substitution.

2. After the partial resection of a lymph-gland, a cure is obtained with the formation of cicatricial tissue, without regeneration of the part excised.

3. In particularly morbid conditions it is possible to obtain a neoformation of lymph-glands, which increases the number of lymph-glands of a given region, either by a proliferation of the pre-existing gland, or by the transformation of the adipose tissue (according to Bayer), or by the development of embryonal germs.

RAOUL L. VIOBAN.

**Hoskins, R. G.: The Present Status of the Adrenal Problem.** *J. Lab. & Clin. Med.*, 1916, i, 512.

The author reviews the literature during the past ten years and summarizes the work that has been done on this subject. He comes to the conclusion that the fundamental question remains yet to be answered, Why does the removal of the adrenal glands cause death? He believes that the trend of the evidence now available suggests that muscular metabolism is at fault. If that be true the solution like that of many another of the most puzzling medical problems, rests in the hands of the biological chemists.

GEORGE E. BEILBY.

**Stewart, G. N., Rogoff, J. M., and Gibson, F. S.: The Liberation of Epinephrin from the Adrenal Glands by Stimulation of the Splanchnic Nerves and by Massage, Studied by Means of the Denervated Eye Reaction.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 205.

The observations of a number of investigators have indicated that during electrical stimulation of



the splanchnic nerves, epinephrin passes into the circulation by the adrenal veins. These observations may be divided into two groups: (1) those in which blood has been collected from the adrenal veins of one animal, and tested for epinephrin by its action on the blood-pressure when injected into the veins of another animal; (2) observations in which the liberation of epinephrin has been deduced from changes in the blood-pressure or other reactions in one and the same animal.

It is shown in the present study (on cats and dogs) that the response of the denervated eye to stimulation of the peripheral end of the splanchnic nerves, is due solely to the passage of a substance in the blood stream from the adrenals to the eyeball. For —

1. When the venous path is blocked the response fails, but appears on releasing the block, and at the same interval of time as when the vessels are free. The active substance must therefore have accumulated during the period of stimulation of the nerves behind the block.

2. When the heart is stopped by stimulation of the peripheral end of the vagus, stimulation of the splanchnics produces no effect on the eye. But on allowing the heart to beat again, the eye response occurs at approximately the same time from the moment of re-establishment of the circulation, as the time interval between stimulation of the splanchnics and the response with the circulation is going on normally. During the stoppage of the circulation, by complete cardiac inhibition, accordingly, stimulation of the splanchnics must have caused liberation of the active substance at the same point from which it starts when the splanchnics are stimulated without cardiac inhibition.

3. When the circulation is slowed without being stopped, as by producing partial inhibition of the heart through the vagus or by hæmorrhage, the interval between the beginning of stimulation of the splanchnics and the appearance of the eye response is correspondingly increased.

4. It is possible to find a strength and duration of stimulation of the splanchnics with which no eye response will be obtained, when the ipsilateral or both carotids are clamped, but which will give a response with the vessels free. With longer or stronger stimulation, a response, but a belated one, may occur even with the carotids clamped. The abolition of the response, and its retardation, can be imitated when appropriate doses of adrenalin are injected into the femoral vein with the carotids clamped or free.

5. When adrenalin is injected into the left renal vein, or into the central end of the femoral vein, in suitable amount to produce an eye response approximately equal to that produced by a given stimulation of the splanchnics, the interval of time after which the response follows is sensibly the same for adrenalin injection as for splanchnic stimulation.

6. When the aorta is clamped, and the splanchnic then stimulated, a response may be obtained in the

eye while the clamp is still on, or only after its removal, or both during the application and after removal of the clamp. There is some variability in this regard in different experiments. There is also a somewhat greater variability in the time interval at which the response appears than in observations in which the splanchnics are stimulated with the vessels free, or with the veins clamped. The interpretation of these differences is discussed.

7. Circulation time measurements show that there is always more than sufficient time for a substance to have been carried in the blood from the adrenals to the eye before the appearance of the eye reactions.

8. The latent period of liberation of epinephrin from the adrenals on stimulation of the splanchnics is short, since the time interval after which the eye response occurs is sensibly the same whether it is evoked by splanchnic stimulation or by the injection at the level of the adrenals of a quantity of adrenalin sufficient to elicit a response similar in character and amount.

9. The minimum period of stimulation of the splanchnics needed to liberate sufficient epinephrin to elicit a response in the denervated eye is very brief (a fraction of a second). With a current of given intensity the amount of the response increases up to a certain point with the duration of the stimulation.

10. Massage of one or both adrenals causes definite eye response in an animal in which stimulation of the splanchnics has been causing it, and at the same interval of time. When, after repeated excitations of a splanchnic nerve, the reaction of the eye ceases to be obtained, it can still in general be elicited by massage of the corresponding adrenal. But this reaction is soon exhausted.

11. Good eye reactions have been obtained by stimulation of the splanchnics in cats, in which attempts were made before the experiment to exhaust the epinephrin store of the adrenals, for example, by frightening or by administration of morphine. It did not seem that it was easier to exhaust the capacity of the splanchnic nerves for eliciting these reactions in such animals than in animals which were guarded as much as possible against preliminary exhaustion of the epinephrin store by psychical disturbances.

GEORGE E. BEILBY.

**Brown, E. D.: Observations on the Effect of Epinephrin on the Medullary Centers.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 195.

Brown calls attention to the fact that the slowing of the heart-beat commonly observed when epinephrin is introduced into the circulation is almost universally held to be due to an excitation of the vagus center, which is induced by the rise in blood-pressure, and therefore is an indirect effect. The question as to whether epinephrin has any direct action upon this center is still unsettled, and there is but little experimental evidence reported in the



literature which would suggest that the drug might produce a direct stimulation.

The present investigation was undertaken with the hope that some additional facts might be discovered which would aid in solving the problem. The experiments here reported were performed on 22 dogs, and a tabulation of the results obtained on 14 dogs where epinephrin had been introduced showed that in 9 of these there was a slowing of the heart, while in 5 it was absent.

The results obtained from the experiments tend to show that when epinephrin is perfused through the cerebral circulation, it may in a certain per cent of cases cause a slowing of the heart and that this slowing is at least in part due to a direct stimulation of the vagus center. There is certain evidence which strongly suggests the probability that the drug also stimulates the vasomotor center. The effect on the respiratory center is very variable. There is evidence of both stimulation and depression, and neither of these effects appears to be governed by the size of the dose of the drug. GEORGE E. BEILBY.

**Diena, G.: The Behavior of Some Pancreatic Ferments in the Blood After the Ligation of the Pancreatic Ducts** (Sul comportamento di alcuni fermenti pancreatici nel sangue dopo la legatura dei dotti pancreatici). *Internat. Beitr. z. path. u. ther. d. Ernährungss.*, 1915, V, 405.

According to the researches of Wohlgemuth if the pancreatic ducts of a dog are ligated, after a few hours there is noted a strong increase of diastase in the urine and in the blood. This reaches a maximum within twenty-four hours after the operation; it remains for some days at this maximum and at the end of eight or ten days goes back to its original figure.

The author's research was carried on in an endeavor to find if in addition to diastase other pancreatic ferments, particularly lipase and esterase, increased in the blood after ligation of the pancreatic ducts. His results confirmed Wohlgemuth's.

Regarding lipase he was unable to find it immediately after ligation of the ducts, but he constantly found it at the end of forty-eight hours, up to the sixth day after operation, with a maximum on the second day.

Esterase exists in the blood serum before operation and increases notably following it.

W. A. BRENNAN.

**Robertson, T. B.: The Effects of Tethelin; Acceleration in the Recovery of Weight Lost During Inanition and in the Healing of Wounds.** *J. Am. M. Ass.*, 1916, lxvi, 1009.

The author gives a brief outline of the method of isolating the growth-controlling principle, which he terms tethelin, from the anterior lobe of the pituitary body, its chemical properties, and physiologic actions. The dried tissue of the anterior lobes of ox pituitaries is extracted with boiling absolute alcohol, and the solution is evaporated under reduced pressure until solid material begins to separate

out on cooling. To this solution is added one and one-half times its volume of dry ether. The substance is thus precipitated and after washing in large volumes of alcohol-ether mixture in the above-mentioned proportions, it is then ready to be dried and pulverized.

Tethelin is soluble in water, also in alcohol, ether, chloroform, and carbon tetrachloride, and is insoluble in a mixture of absolute alcohol and dry ether. It contains 1.4 per cent of phosphorus and nitrogen. It is markedly hygroscopic, and on standing after pulverization in contact with moist air it darkens perceptibly in color and its iodine absorption value decreases, which decomposition is accelerated by warming, but if packed in evacuated glass tubes and kept perfectly dry it may be heated to a high degree without any perceptible discoloration.

The average yield from each anterior lobe may be estimated to be about 10 mg. of tethelin. The action of this substance in doses of 4 mg. per diem, administered by mouth to mice between 4 and 60 weeks of age, consists in a marked retardation of the early (preadolescent) growth in weight, and an equally marked acceleration of postadolescent growth. Mice which have received tethelin are much more firmly and compactly built than normal animals of the same age, and it also has a favorable effect on the nutrition of the skin of the animals.

Since tethelin appeared to be a strong stimulator of growth it seemed probable to the author that it might also accelerate that species of internal growth which consists in the replacement of tissue lost through excessive tissue waste consequent on any circumstance leading to an increase in nitrogen output or a curtailment of nitrogen input, and he accordingly made a series of investigations on 10 male and 10 female mice about seven months of age. The animals were deprived of food for twenty-four hours, at the end of which time 5 males and 5 females were given tethelin and all the animals were allowed free access to food. At the end of 72 hours comparison between the animals which received tethelin and the controls showed that the administration of tethelin led to a very remarkable acceleration of the regain in weight following the admission of food.

The author also made experiments to note the effect of tethelin upon another form of tissue repair, the healing of wounds, and while, as he states, experiments on animals and especially on mice do not afford the most satisfactory means of investigating this process, his results were so favorable as to justify his opinion that tethelin when administered hypodermatically to mice exerts a remarkably stimulating action on tissue repair as expressed in the healing of granulating wounds. GEORGE E. BEILBY.

## RADIOLOGY

**Kuegle, F. H.: Radio-Activity as a Therapeutic Agency.** *Med. Herald*, 1916, xxxv, 172.

After reviewing briefly the events which led to the discovery of the roentgen ray and such radio-



active elements as uranium and radium, the author describes their applicability as therapeutic agents. Regarding their relative values, he states that they are practically identical in their action, differing only in the quality and quantity of the rays produced. The choice of one or the other depends upon the anatomical location of the diseased tissue and the peculiar requirements of the case to be treated. He lays stress on the matter of proper dosage and technique, if beneficial results are to be obtained.

Among the conditions mentioned in which radioactive treatment was found to be particularly useful, were enlarged lymphatic, tuberculous, and lymphocytomatous glands, dysmenorrhœa, uterine hæmorrhage, and fibroids at or near the menopause yielded uniformly good results. Chronic joint diseases and even some selected cases of tuberculous joints showed a fair percentage of cures or improvement. In the latter cases the author believes that the simultaneous use of Bier's hyperæmia treatment enhances the effect of the irradiation. In exophthalmic goiter the results were so favorable that he believes with Sielmann and Schwartz that it is to be preferred to surgery where simple medical treatment has failed.

Regarding the use of radio-activity in cancer, the author quotes a summary from an article by Russell to the effect that its use in no wise should supplant operation unless it be in the removal of certain superficial growths, but that it be used rather as an adjunct to surgery.

ADOLPH HARTUNG.

**Perkins, C. W.: The Normal Stomach; Its Size, Position, Form, Tone, Peristalsis, and Mobility from a Radiographic Standpoint.** *Med. Press & Circ.*, 1916, ci, 258.

After an examination of 58 normal stomachs radiographed in the vertical position and filled with an opaque meal of buttermilk and bismuth subcarbonate, Perkins draws the following conclusions:

1. Peristalsis does not seem to exert any influence on the tone of the stomach, for we may have exaggerated peristalsis with a hypotonic stomach and diminished peristalsis in a hypertonic stomach.

2. There are no determined fixed points of any type of stomach in the abdominal cavity except the cardiac portion. A stomach may be of any of the types and yet be normal from an X-ray standpoint.

3. The average normal stomach is orthotonic. The usual position of the orthotonic stomach is as follows: greater curvature (lowest point) one to two inches above the interspinous line, either median or to the left; lesser curvature (lowest point) three to four inches above the same line, median or one to two inches to the right. The pylorus is placed two or three inches above the line, in the median position, or one and a half inch to the right. The axis of the stomach is vertical and parallel to the median line. The length is eight to ten inches and the width three to three and a half inches.

4. The tendency of the male stomach is always toward hypertonicity, while that of the female is

toward hypotonicity. The stomach is not, as a rule, as high in the abdominal cavity as many textbooks of anatomy teach. There is no structure in the human body, however, that has such variations in form, tone, and position.

5. Radiographic examination, either by the fluorescent screen or plate, is the only accurate method of ascertaining the anatomical position, form, peristalsis, and mobility of the stomach. Therefore, bearing in mind that this type of stomach fits the patient, a chart of the relative positions of the stomach should be of service to the clinical diagnostician in locating pathological lesions of that organ; that is, if he has not X-ray apparatus at hand. Such a chart should also be of service to the radiological technician in locating points for radiographic work.

E. H. SKINNER

**Hernaman-Johnson, F.: The Uses and Limitations of Stereoscopic Radiography in the Diagnosis of Injury to Bone; the After-Treatment of Fractures as Carried Out in the Electrical Department of the Cambridge Hospital, Aldershot.** *Practitioner*, Lond., 1916, xcvi, 249.

The method has a well-defined place in radiographic work. It can neither be dispensed with nor employed to the exclusion of other well-known procedures, as, for instance, in localizing other foreign bodies. It is essential in the diagnosis of injuries to the shoulder, spine, pelvis, and hip. In these regions plates in one plane may be misleading, and the solid effect produced by the stereoscopic view is the only means of checking the oftentimes misleading appearance seen in an ordinary plate. By reversing the plates in the stereoscope, an appearance is produced as if one were looking at the other side of the bones under examination. A bone or joint is never explored radiographically until four sets of stereograms have been taken, anteroposterior, postero-anterior, right lateral, and left lateral. By means of such plates a general view of the relations of the various bones can be obtained, yet one must remember that the exact relationship of distances will be distorted. It is usually possible to say whether a bullet is at one side or the other of the bone or buried within it, and to determine the relative position of fragments; but the stereoscope must not be regarded as an instrument of precision for localization purposes.

The author finds that the use of electricity in the after-treatment of fractures is a distinct advantage where massage and passive motion have not restored the member to normal use. He advises a combination of galvanism with a mild faradism in the form of baths. With a continuous current of 20 to 30 milliamperes used for 20 minutes daily, the faradic current must not be of sufficient strength to cause any distinct muscular contraction. Massage and muscular exercises must be used in conjunction with the electrical treatment if the best results are to be obtained. Fractures in the neighborhood of the elbow, wrist, and ankle will give a normal result



under this method within a month to six weeks. Where weakness is complained of in the limb consequent to fracture, the author advocates rhythmical electrical stimulation by the faradic current, preferably by a Lewis-Jones electrical apparatus arranged to give at least 20 impulses a second. Such a condition of weakness may occur after prolonged immobilization in which all the muscles in the vicinity are affected, or where through faulty position a particular muscle group has been overstretched. In the latter case, a relaxation splint is essential for cure. In general up to a certain point the parietic phenomena are no doubt largely physical, but there is from the first a certain mental element present, a kind of failure of memory as to how the lost movements are to be provoked, in other words, a lack of action patterns in the memory of the movement of the affected part. Stimulation of the individual muscles electrically, therefore, has its greatest usefulness under such conditions. There is a type of pain complained of, following fractures, where the appearance of the limb has become quite normal again and the movements good. The patients describe it as being like toothache. It is made worse by exercise and often keeps the patient awake at night. The application of the high-frequency current by the vacuum electrode, at first on the skin and later at sparking distance, gives relief in a few days. In case pain is not relieved, a careful X-ray examination, with a view to the possible detection of some definite cause, as the presence of a small abscess cavity in the middle of the new formed bone, should be undertaken. X-rays are often of value in relieving pain and causing the disappearance of previous fibrous accumulation. HARRY G. SLOAN.

**Turner, D.: Report on the Radium Treatment at the Royal Infirmary, Edinburgh, During the Year 1915.** *Edinb. M. J.*, 1916, xvi, 204.

Some interesting points have been presented in this detailed report of 64 cases treated during the past year, 24 of which were malignant and inoperable of this class; 8 being sarcomata in which better results are to be expected if they are favorably situated. He also found carcinomata of the vagina and cervix would usually yield, if localized, but recurrence after a variable length of time was the rule. However, during the interval the patient enjoyed relief from pain, gained in weight, and was in fair health. A preliminary curettage is often of great service. Screening has been found unnecessary in these cases, except to protect the healthy tissues; the dosage should be at least 3,000 milligram hours. In rodent ulcers the results are invariably good, and if they recur it is usually due to insufficient primary treatment. The cosmetic result leaves nothing to be desired. For this reason Turner has employed it in the treatment of papillomata, naevi, and recent cheloids. Nine cases of exophthalmic goiter were treated, two of them being males. While there was very little change in

the gland, in fact in one instance it became larger, yet the treatment had some influence upon the general system, for the symptoms were controlled and the health was greatly improved. In these cases a 1.4-mm. silver screen was used, 20 mg. of radium bromide being placed 2 cm. from the skin and left in place for twelve hours. Under these conditions no damage was observed to the overlying integument. This treatment was repeated in 2 or 3 months.

The author believes that while the field of utility for the use of radium is limited, its value in certain well-defined directions has been firmly established. W. S. NEWCOMET.

**Beck, E. G.: An Accurate Method of Localization of Foreign Bodies in the Chest, and Their Removal.** *Interst. M. J.*, 1916, xxiii, 259.

The author discusses the value of stereoscopic radiograms in locating foreign bodies, particular stress being laid on the fallacy of attempting to determine from a single radiogram the exact location of foreign bodies, as well as the fallacy of attempting to form a correct view of the position of fragments after a fracture. To illustrate this point the author placed a bullet on the center of the sternum. Two radiograms were taken without changing the patient's position, but the X-ray tube was shifted to a different angle. On each picture the bullet appeared to be in a different location. The cases cited by the author attest the value of the method. In one instance a would-be suicide shot herself with a 42-caliber pistol. The bullet from a single radiogram seemed to be in the axilla. The stereoscopic readings showed the bullet to be against the scapula. It was found there. Beck uses the method in intestinal work, in studying diseases of the accessory sinuses, in estimating the depth of empyema cavities, and in fractures.

ISIDORE COHN.

**Millwee, R. H.: Five Hundred Gastro-intestinal Examinations by Roentgen Ray.** *Texas M. News*, 1916, xxv, 415.

Millwee reports upon 500 consecutive gastro-intestinal examinations by the roentgen ray with a barium sulphate meal suspended in artificial buttermilk. The roentgen diagnoses in these 500 cases were as follows:

Duodenal ulcer.....	111
Ptois, atony, and stasis.....	143
Appendix involvement.....	104
Gastric ulcer.....	48
Gall-bladder involvement.....	30
Gastric cancer.....	28
Miscellaneous.....	19
Negative findings.....	29

The author was able to follow up 80 per cent of these cases with the following checking: Of the cases operated upon for duodenal ulcer a lesion was found in the duodenum in all but one case;



this case had gall-stone with adhesions. Of the cases treated for duodenal ulcer all responded to treatment except 11.

Fifty per cent of the positive appendix cases were operated upon, all of which showed involvement. In the cases of gastric ulcer and gastric cancer all of the cases operated upon revealed either an ulcer or a cancer with the exception of one case in each group, which showed gall-bladder disease with adhesions.

E. H. SKINNER.

### MILITARY SURGERY

**Mullally, G. T.: A Case of Tetanus-like Spasm Localized to the Wounded Limb.** *Lancet*, Lond., 1916, cxc, 867.

Mullally describes a case of shell-wound of the lower end of the femur which necessitated amputation. The case was complicated by gas infection which necessitated extensive opening up of the thigh. A few days after the injury, twitching in the stump began and grew progressively worse, the spasm becoming so painful that chloroform had to be given to control the pain. The author thought that he was dealing with an ascending neuritis in the stump and resected the antero-crural and sciatic nerves without relief. The patient died on the tenth day, at which time the facial expression was suggestive of risus sardonius. A prophylactic of 1,500 units of antitetanus serum had been given the day of the injury. The author feels that the case was one of tetanus, although there were no general spasms.

F. D. DICKSON.

**Weinberg, M.: Gas Gangrene in the Present War.** *Glasgow M. J.*, 1916, lxxxv, 241.

Gas gangrene has been especially prevalent in the present war. The bacteriology of gas gangrene has been carefully worked out. The bacillus aerogenes capsulatus, otherwise known as bacillus perfringens, is found in nearly all cases. Only in exceptional cases, however, is it found alone, other organisms being usually associated. These other organisms may be diplococci, streptococci, bacillus proteus, and bacillus sporogens. Another combination of organisms occurs in which the bacillus of malignant oedema (vibrio septique) is the predominating organism. Other organisms are usually associated with the vibrio septique, which is a relatively rare agent in gas gangrene, being found in only 4 out of 100 cases.

In the toxic form, the bacillus oedematis is found associated with the bacillus perfringens and vibrio septique in the classic form of gas gangrene. From the foregoing it is readily seen that most of the organisms related to the production of gas gangrene belong to the intestinal flora.

Gas gangrene was produced experimentally in guinea pigs by using any of the above-mentioned organisms. In the production of gas gangrene it is necessary to inject a relatively large number of microbes. There must be some contributory cause

to account for the small number of bacteria necessary to produce gas gangrene in wounded soldiers. The dissection of limbs amputated for gas gangrene has demonstrated that the gangrene is not due to the presence of organisms but is secondary to an obliteration of the main vessel or vessels. The organisms of gas gangrene find this a very favorable soil for growth. Another factor which is of prime importance in the production of gas gangrene is injury to tissues, especially to muscle. Experimentally it is very easy to show that hemorrhage and artificial injury of muscle favor the infection in question.

The treatment of gas gangrene in the early stage is the treatment of wounds which are probably infected. The wound should be thoroughly cleansed, all foreign material removed, and the wound kept as wide open as possible. Continual or frequent irrigation with normal saline solution, hypertonic salt solution, or various antiseptics is recommended.

The polyvalent serum of Leclainche and Vallée seems to have given particularly good results in wounds infected specially by streptococci. In the opinion of the author the best autovaccine is one prepared with all the organisms, aerobic and anaerobic, that are found in the wound to be treated.

Early amputation is often necessary, and where not considered necessary many surgeons apply the actual cautery over the whole extent of the invaded area. Free incisions are a matter of routine treatment. Unfortunately, many cases result fatally in spite of the best that can be done. J. H. SKILES.

**Lansdown, R. G. P.: Removal of Bullets and Other Metallic Foreign Bodies.** *Bristol Med.-Chir. J.*, 1915, xxxiii, 157.

There are four points which should be emphasized in the localization of bullets by X-ray: (1) Every case should be carefully screened by a skilled skiagrapher accustomed to the work of localization. (2) In determining the direction of the "central ray" the smallest diaphragm must be used. (3) It is essential in all difficult cases that the operator should be present when the localization is made, as it is of paramount importance that the patient should be in the same position for operation as when the localization was carried out. (4) The localization should be made as short a time as possible before operation, owing to the liability of the metallic body shifting its position.

The skin is then marked by a small cross made with a sterilized surgical needle. The patient is taken immediately to the operating room and the following procedure is carried out. A telephone apparatus is connected, one electrode being placed on the sound limb of the patient, the other being connected with a sterilized probing needle. The needle is inserted at the cross-mark on the skin in the direction of the foreign body. When it touches the foreign body the circuit is completed and a distinct tapping sound is heard at the telephone receiver. A small incision is then made, and the

probing needle carefully followed until the foreign body is found along its course.

The advantages claimed for this particular type of bullet localization are as follows: (1) There is only one pole to strike the metal. (2) The pole consists of a sharp, long needle. (3) No skin incision is necessary for the detection of the metallic foreign body. (4) No damage is done to the tissues, for if no metallic foreign body is detected no incision is made. (5) That portion of the apparatus which approaches the area of operation is simple and inexpensive, easily replaced and can be readily sterilized.

The indications for removing a bullet or piece of shrapnel are as follows: (1) All superficial metallic foreign bodies which cause any discomfort or are likely to give trouble by their presence should be removed. (2) In gunshot wounds which do not heal, or where sepsis continues, if a foreign body is present it should be removed. (3) Deeply situated bullets or pieces of shrapnel should be removed from limbs if of large size and causing any inconvenience. If causing no inconvenience, they should not be disturbed. (4) Those situated within the thorax, unless easily reached, are better left alone. The author has seen two cases, with no symptoms, in one of which a round shrapnel bullet was lying on the summit of the arch of the aorta; in the other a piece of shrapnel casing was lodged on the right side of the arch. Both were left alone. (5) In the abdomen, if found on repeated localizations to be in the same position, the bullet should be removed. If on repeated examinations the bullet is found in different parts of the abdomen, it is probably free in the peritoneal cavity, and can be removed generally from the pelvis if the man has been walking about. Bullets so placed are treated much in the same way as other foreign bodies in the abdomen. Dame Nature wraps them round with adhering coils, and eventually they will be extruded *per vias naturales*. (6) In the head. Bullets situated in the scalp, in the face, or in the bony case of the skull should be removed, and, in the latter, portions of depressed inner tables should be looked for. If situated within the brain itself it is impossible to lay down general rules. If the wound is septic around the bullet, a large area of brain necrosis may be extruded, and the patient dies suddenly. Where the bullet is situated immediately under the skull, provided it has been carefully and accurately localized, it should be removed by the shortest route.

J. H. SKILES.

**Turner, G. G.: The Importance of General Principles in Military Surgery.** *Brit. M. J.*, 1916, i, 401.

The principles which underlie surgical practice in general are exactly the same as those which govern the injuries met with as the result of modern firearms. In nearly all the reports from the seat of war, the need of guidance by general principles is being recognized.

The peculiarities which undoubtedly exist are due to the nature of the weapons and to the conditions under which the wounds are received and in which the injured man has to exist for some time afterward. In other words, it is a question of environment rather than any inherent peculiarity in the wounds themselves.

It has been said that antiseptics in war surgery are of no value and some have gone so far as to infer that antiseptics are, therefore, useless in general.

The nature of many of the wounds, especially those produced by shells, makes them exceedingly difficult to cleanse, even under the most favorable circumstances, and to deal thoroughly with some of them would be quite a major operation, taking considerable time. Unless the body can be protected against sepsis by some means without local interference, the septic infection of a certain proportion of wounds sustained in warfare will certainly occur. For wounds already infected, boracic fomentations, gauze wrung out of 1:1,000 mercury perchloride and used while moist, or a solution of the same strength made with methylated spirit and, at times, irrigation with solutions of hydrogen peroxide or iodine water, are relied upon. One or two cases have been disappointing, but the great majority have done splendidly so far as wound healing is concerned.

All who have to deal with the wounded are insistent on the importance of drainage, and when one considers the undermining of the tissues, the masses of broken-down material that must be cast off by a suppurative process, and the pockets and side channels which so frequently occur, it is easy to understand the necessity of providing a free outlet for discharges.

Another important principle to be noted is the importance of fresh air in combating infections.

It is a principle in surgery, which is apt to be forgotten, that all the gross sources of sepsis ought first to be dealt with before falling back on vaccines, etc. It is very important to remove a septic focus.

In the great majority of cases it is wise to remove a foreign body, if this can be done without running any grave risk so far as the life of the patient or the function of the affected part are concerned. There are constantly admitted to the hospital patients whose wounds are healed and who have returned to duty, but who do not feel satisfied because of the knowledge of the presence of some extraneous foreign body in their anatomy. It makes all the difference in the world to a man whether his foreign body is in his chest wall or in his waistcoat pocket. It is, after all, a psychological matter in many cases, and if such a gross mechanical performance as a surgical operation can lift a permanent load from the patient's mind, then strong reasons are required for refusing to operate. Certain principles must always be kept in mind: First, one must clearly recognize that if good results cannot be secured one has not



the right to run the risk of doing serious harm. Secondly, no one should undertake the removal of a foreign body without very careful consideration as to its exact position and relation to surrounding structures. An operation for its removal should never be carried out without an X-ray examination, because so often there are multiple foreign bodies or there are concomitant injuries to bones which can be dealt with at the same time. No attempt should be made to remove foreign bodies without careful localization, unless they can be certainly felt near the surface. As the foreign body is always potentially a source of infection, the area from which it has been removed should always be drained.

Ill-considered attempts to remove small foreign bodies embedded in muscular parts should be avoided, and indeed they are of minor importance because they are not likely to give rise to much trouble in such situations.

At the beginning of the war and for some time afterward, foreign bodies in the chest were supposed to be in sacred ground and patients were universally advised to have them left alone. Being impressed with the amount of mental anguish which some of these men appeared to endure because of the knowledge that they had a foreign body in their lungs, the author has, on four occasions, deliberately opened the chest and removed bullets or shell casing, in each case with complete recovery.

Extensive comminution is the most characteristic feature of gunshot injuries of bone and may exist both with and without separation of the fragments. A bullet may pass through a bone, making a regular trephine opening with or without complete fracture or comminution, or the foreign body may be lodged in the bone or in the neighboring soft parts.

So far as the wounds are concerned, the same principles apply as in the treatment of compound fractures sustained in civil life. A most important point is to resist the temptation to remove loose fragments, for there is abundant evidence in surgery to show that bone is the best stimulus to the formation of bone. It is impossible to say how much bone will live or die; that question can only be settled by Nature, and in almost every instance she spares more than one would expect.

There is a great temptation to use plates and screws, but it is doubtful whether this is good practice in compound fractures. It will take a good deal of evidence to show that internal splinting is to be accepted as a principle in the treatment of gunshot injuries.

In most cases the principle of extension must be employed and this more so than in civil life because so often there is great shattering of the bone or actual loss of substance. To carry this out in the lower limb often causes much trouble, and a great deal of ingenuity has been exercised in the manufacture of apparatus for this purpose. In the upper limb the problem is simpler and for fractures the weight of the limb can usually be relied upon to se-

cure the necessary amount of extension, and with excellent results. Most of the author's cases of gunshot fractures of the humerus are treated by suspending the wrist in a short sling, sometimes with the addition of pieces of gooching applied over the seat of fracture and fixed to the chest with a circular bandage.

The surprising way in which injuries to joints recover with a good range of movement has frequently been a matter for comment, but, nevertheless, all cases do not result so favorably. Since it is usually impossible to tell at an early stage of the case whether or not ankylosis will occur, it is very important to deal with these cases in such a way that, should such an untoward result follow, the limb will be in a useful position. This rule should always be followed whatever the cause of the joint injury, but it is especially exemplified by numbers of cases met with in military practice.

EDWARD L. CORNELL.

**Camus, J., and Quiserne: Physical Treatment for Disabled Soldiers.** *Lancet*, Lond., 1916, cxc, 691.

Results of the physical treatment for disabled soldiers are even more striking than had been supposed. A very large proportion are cured or so greatly improved that they are rendered again fit for military service. During the month of December, for example, 84 per cent of the officers and men discharged were thus fit after a mean duration of treatment of 40 days. Apart from military efficiency, it is easy to see what a saving in grants and pensions such a result implies.

It is necessary to supervise the men when the limit of beneficial result has been reached and to see that they then undergo a further special military training. At a certain stage, too, military exercises form an excellent supplement to the mechanical treatment and a group of invalided non-commissioned officers has been assigned to this work and their presence exerts a helpful influence on the men's recovery.

It has been found that movements made with very heavy weights by no means give the best results, and that the order in which the apparatus is employed is a matter of importance. Fatigue lessens the good results and the application should be continued only as far as the point at which movements become painful. The apparatus, as installed in many institutions on the Continent, is largely arranged for passive movements and hence requires driving force and machinery of a complicated nature. A great simplification for the purpose in hand has been introduced by the selection of twelve relatively simple pieces of apparatus for active movements alone.

Illustrations of these twelve machines, which have been found to provide all the essential movements, and two sets of which are stated to suffice for quite a large institution, are reproduced in the original article.

EDWARD L. CORNELL.

**Isnardi, L.: Treatment of Septic Wounds Without Drainage** (Cura delle ferite di guerra settiche senza drenaggio). *Gior. d. r. Accad. di med. di Torino*, 1915, lxxviii, 439.

Isnardi is opposed to the employment of drainage in the treatment of septic wounds. Of 290 wounds treated by him in the Reserve Hospital of Vercelli, 32 were very grave and septic. Most of them were fracture wounds. The treatment consisted in clearing the wound; immediate reduction of the fracture with traction apparatus; immobilization of the articulation; no examination with sound, radioscopic examination only; no searching for nor extraction of spiculæ, etc., unless apparent; no manipulation; plentiful use of gauze and absorbent cotton; immobilization and elevation of the limb. No drainage whatever is used. All the 32 cases have recovered with preservation of their limbs.

Isnardi is of the opinion that drainage and incisions disturb the progress of the reparatory process. Drains, whether gauze, rubber, or glass, are foreign bodies which irritate the tissues and give a harboring stronghold and breeding place to microbes. Incisions expose damaged tissues which would better recover under an intact skin. Drains do not favor the elimination of exudates. The track fissures made by the projectile will always offer a better pathway.

W. A. BRENNAN.

**Saint, C. F. M.: The Principles of Treatment and Their Application to Wounds.** *Brit. M. J.*, 1916, i, 367.

The principles of treatment are: (1) remove the cause; (2) combat the effects; (3) assist the reaction; (4) prevent complications or deal with them if they have arisen.

Removal of the cause depends upon its location as to the probable presence or absence of infection. A superficial metallic body should be removed. When deeply placed it should not be removed unless there is probability of infection and proper X-ray equipment is at hand to aid in its localization. Under special circumstances even a sterile bullet may need to be removed; for example, when from its position it gives rise to irritation of nerves, interferes with the movements of a joint, etc.

In combating the effects the general condition of the patient is extremely important. Quiet and freedom from pain, secured if necessary by morphine, are absolutely essential. Stimulants must be given with caution, small doses frequently given being preferable to large doses. Transfusion is the chief remedy, saline being usually used, preferably by rectum or subcutaneously; but occasionally intravenously.

The treatment of the local condition involves the control of hæmorrhage, either by pad and pressure, forci-pressure, ligature, suture, or vessel suture. The importance of ascertaining that no tourniquet is left on a limb too long is emphasized.

In assisting the reaction the course followed depends upon the condition of the wound when the

case arrives. Since most cases are infected an antiseptic is first used and the wound thoroughly cleansed. Aseptic wounds may be closed and primary unions secured.

The complications are numerous, one of the most important being sepsis. This is combated in numerous ways, many antiseptics being used. Hypochlorous acid is the most popular at present. Efficient drainage, lymph lavage, secured by hypertonic solutions and Bier's hyperæmia are all important in hastening recovery. The general resistance should be supported by fresh air, quiet, and plenty of nourishing food.

The following rules have been elaborated by the author for the treatment of head injuries.

1. The wound was dressed, the lotion used for the removal of the old dressing being 1 in 20 carbolic. Mercury perchloride was contra-indicated because iodine had invariably been used lavishly, often producing blistering. If further investigation proved to be necessary, the wound was packed with spirit gauze wrung out of 1 in 3,000 mercury biniodide.

2. An anæsthetic was administered.

3. The head was washed in 1 in 20 carbolic lotion, and the hair shaved off while the carbolic was dripped on, following the razor.

4. The bruised edges of the wound were trimmed with mouse-toothed forceps, knife and scissors, and the wound dried and swabbed throughout (including exposed brain) with pure carbolic acid. In more extensive wounds the excess of carbolic was neutralized by methylated spirit, otherwise it was mopped away.

5. A large flap was reflected, usually with the wound in its center.

6. The skull was trephined, all loose depressed bone removed, and projecting edges nibbled away. No extensive search was made for distant pieces of bone or foreign body. Bleeding was arrested by fine suture, muscle tissue, or packing.

7. Exposed brain and dura mater were covered with spirit gauze wrung out of 1 in 3,000 mercury biniodide, the free end being pulled through the original wound. A tube was introduced in some cases.

8. The operation wound was sutured with silk-worm gut.

9. Three days later the gauze was removed; the tube might or might not be removed; if left it was removed at the next dressing.

10. Where the original wound resembled an incised wound, secondary sutures were inserted on the fifth or sixth day. In punctures this was not necessary, and in extensive laceration and destruction it was not possible.

J. H. SKILES.

**Soresi, A. L.: Painless, Rational, and Economic Treatment of Wounds** (La cura indolere, razionale, ed economica delle ferite). *Gior. d. r. Accad. di med. di Torino*, 1915, lxxviii, 404.

Soresi claims many advantages in the use of paraffin in the surgical treatment of wounds, both



in its elimination of a great deal of the unnecessary pain caused by gauze dressings and drains, and also on account of its inert, sterile, and other qualities which prevent it from being in any way irritating to the tissues.

His method consists in the application of a paraffinized surface over the injured area and the covering of the drain tube with paraffin. The paraffin which is placed in a shallow dish is kept liquid by having the dish inserted in another containing warm water. A piece of gauze about the size of the surface to be covered is dipped in the paraffin. While the paraffin on the gauze is still tepid the gauze is placed over the wound and trimmed to size.

Drains are prepared of pieces of rolled gauze dipped in the paraffin; or, when the exudate is very abundant, a metal tube of very fine mesh is dipped in the paraffin, which must not be very warm, and when the paraffin becomes solid the tube is ready for use.

The advantage of this method is that the dressings or tubes are non-adherent and give rise to no pain, irritation, or hæmorrhage. W. A. BRENNAN.

**Flint, J. M.: The Organization and Problems of a War Hospital.** *Mil. Surgeon*, 1916, xxxviii, 405.

Professor Flint has had charge of an American hospital in France during the present war. Most of the cases which are severely wounded must be transferred to a base hospital such as is conducted by Flint, and the work at these institutions is extremely varied.

Localization and extraction of projectiles form one of the most interesting and frequent operations. Compound fractures are extremely numerous. Most of the cases are infected. Lesions of the nerves and blood-vessels are numerous, but still joints and chronic osteomyelitis form a large number of the old cases in any base hospital.

The hospital in question was originally a château situated in a park of about eighty acres, and the transformation of this into an efficient modern hospital necessitated a great deal of ingenuity and industry. A detailed description is given of the organization of the hospital, its personnel, and the efficient manner in which a large number of wounded may be taken care of in a short time.

J. H. SKILES.

**Miller, R. B.: Proposed Equipment for the Hospital Corps Soldier.** *Mil. Surgeon*, 1916, xxxviii, 421.

A board was recently organized by the war department to recommend improvements in the equipment for the hospital corps soldier. Two items especially were recommended for revision; i.e., the hospital corps pouch with its contents and the hospital corps knife. After much deliberation a new pouch was devised in the form of a belt with numerous compartments. A hand axe was substituted for the hospital corps knife. The advantages claimed for the proposed equipment are as follows:

1. It is more comfortable to the wearer.
2. It weighs less.
3. The weight is uniformly distributed.
4. There are no constricting straps across the chest.
5. No part of the equipment hangs about the soldiers' legs, interfering with locomotion.
6. It is more durable.
7. It is more military in appearance.

J. H. SKILES.

**Savill, A.: Some Notes on the X-Ray Department of the Scottish Women's Hospital, Royaumont, France.** *Arch. Radiol. & Electrotherap.*, 1916, xx, 401.

The author gives a very interesting and detailed description of the founding of the first French unit of the Scottish Women's Hospital at the Abbaye de Royaumont, twenty-five miles behind the firing line. An X-ray department was established after many seemingly insurmountable obstacles had been overcome. Although electrical energy was available to supply a limited number of lamps in the wards and operating theater, there was not sufficient for running the X-ray from the main. Resource was finally made to a set of 36-ampere-hour accumulators which was placed in the X-ray room. It was necessary to charge these daily, but they yielded very satisfactory results.

A number of interesting case reports, accompanied by illustrative roentgenograms, are included. Of especial interest are those in which foreign bodies were not extracted because they apparently gave no trouble. In many of these, the foreign bodies, apparently long quiescent, would likely someday become the seat of troublesome abscesses.

As the first installation did not include a stereoscope, the Hampson method of localization was employed in most instances, and later the Behiern compass for localizing foreign bodies in the limbs, although this method involves even more screening than the Hampson method. The method most favored by French surgeons was the Hirtz compass. In spite of the great disadvantages and difficulties under which it was necessary to make examinations and localizations, astonishingly good results were obtained.

W. A. EVANS.

## SURGICAL DIAGNOSIS

**Sewall, H.: The Clinical Relations of Gravity, Posture, and Circulation.** *Am. J. M. Sc.*, 1916, cli, 491.

The vascular system, says Sewall, is everywhere in a state of "tone" by which its capacity is actively reduced. This tonicity keeps the blood from stagnating, under the influence of gravitation, in the capacious reservoirs of the abdomen.

The rigidity of the skull keeps the brain relatively full of blood even with a zero of arterial pressure. In the abdomen, on the other hand, the blood-vessels find less support, perhaps, than in any other situa-

tion. The physiological integrity of the splanchnic vasomotor system and of the musculature of the abdominal wall form the chief or only extraneous limitations to expansion of the great "abdominal reservoir."

The splanchnic vasomotor mechanism is sufficient to compensate for the effect of gravity on the blood supply of the brain. Deficient vasomotor tone combined with an atonic condition of the abdominal wall or patulous abdomen must in the erect posture lead to deficient circulation in the brain, and cerebral anæmia, as well as oligæmia of the general circulation.

In the normal subject the fall of carotid blood-pressure, which tends to occur on changing from the recumbent to the erect posture, leads to stimulation of the splanchnic vasomotor center; at the same time the tension of the muscles of the abdominal wall is apparently increased, as is evidenced by the difficulty found in making a satisfactory palpatory examination of the abdomen with the patient upright. In these ways the hydrostatic pressure tending to surcharge the splanchnic veins is compensated, so that with the venous outflow from the brain accelerated by gravity and the arterial inflow kept high by elevation of systemic arterial pressure the nourishment of the brain may be expected to flourish in the erect posture.

In the debilitated individual we must expect to witness the preponderance of gravity effects proportional to the weakening of the physiological powers which had held it in compensation. Now, in the erect posture the blood actually stagnates to a degree in the splanchnic veins at the expense of the systemic circulation and the blood-pressure in the brachial artery falls.

In the group of complaining more or less healthy-looking women in whom it is difficult to localize the pathological condition, and which the physician commonly characterizes as "neurasthenic," measures taken to support the abdominal circulation often seem to give better results than any other, whether or not there is evidence of enteroptosis.

The one physical sign which seems indicative of general, and especially of intracranial, hydrostatic circulatory deficiency is to be found in the postural changes of the blood-pressures. In the normal person in the erect, at least in the sitting, posture, the blood-pressure is higher than when recumbent. When the blood-pressures, especially the maximal, are found higher in the recumbent than in the sitting posture, Sewall concludes there is physiological weakness either of the splanchnic vasomotor system, of the abdominal wall, or both, and that potential cerebral anæmia and vasomotor overstrain are consequences in the erect posture.

The treatment of abdominal circulatory stasis consists in respiratory and resistance exercises, each exertion followed by a period of rest in the recumbent posture. Baths with alternating temperatures, conjoined with massage, have a favorable effect. The subject should lie down for an hour after each

meal and during the latter half of this period a bag of shot weighing ten to fifteen pounds should be placed on the abdomen. Exercises especially adapted to strengthening the abdominal muscles should be employed, such as the rowing machine. To relieve morbid symptoms in the quickest way an artificial support such as a belt, band, or corset should be applied over the lower abdomen.

Sewall concludes that splanchnic stasis is potentially present, and may be the starting-point for vicious circles of derangement, in every case of general functional weakness. Laxness of the abdominal wall probably leads, in the erect posture, to the establishment of a negative pressure within the abdomen, which it is a prime object of treatment to correct. Depletion of the intracranial blood current must follow insufficient compensation of the hydrostatic pressure involved in the erect posture. Virtual anæmia of the brain leading to a multiplicity of disorders is the natural sequence. It is probable that excess of blood-pressure in the recumbent as compared with the erect posture is a trustworthy index of splanchnic stasis. A. EHRENFRIED.

#### MEDICOLEGAL, HOSPITAL, MEDICAL EDUCATION

**Malpractice; Expert Evidence as to Treatment; Patient's Duty to Minimize Damage.** *Med. Rec.*, 1916, lxxxix, 608.

The case of *Dahl vs. Wagner*, 151 Pac. 1079, was that of a suit against a doctor for malpractice in which the plaintiff succeeded in obtaining a verdict against the attending physician. The facts stated briefly are as follows:

The plaintiff, a workman, sustained injuries to his foot consisting of a dislocation of one of the bones and other injuries and bruises. The defendant physician was under contract with the plaintiff's employer to treat the plaintiff under what was called the hospital fee system. Infection followed the wound and the plaintiff was confined in the hospital for over six weeks. After leaving the hospital he called a number of times upon the defendant for treatment. At these visits the defendant advised him to use the foot and do some light work and told him that he would probably have a good foot. The dislocated cuneiform bone was pressed downward and forward to such an extent that the protruding end of the bone carried the weight of the body, causing pain. The specific allegation of the defendant's negligence was that the defendant had neglected to properly reset the bones by manipulation and had failed to perform an operation by cutting the foot open and forcing the dislocated bone back into place.

The jury returned a verdict in favor of the plaintiff, but the trial judge set aside the verdict and entered judgment "*non obstante veredictum*" for the defendant. The case was appealed by the plaintiff and on appeal the above facts were practically undisputed.



The main point in issue was: Was the defendant guilty of malpractice in not attempting to set the dislocated bones by manipulation; the time passing when this should have been done, should the defendant have performed an operation? A medical expert for the plaintiff expressed the opinion that if there was swelling and infection during the acute stage, an effort should have been made thereafter to restore the functions of the foot; the presence of the swelling and infection would prevent resetting or operation during the acute stage. The sooner the swelling was reduced the better. Medical experts for the defendant testified that it would have been foolhardy to attempt to reset the bones in any way until all danger of infection had passed and the wound healed completely; that the cutting of the tissues prior to this time would have been hazardous; that the bone would not have remained in place, if set; that an operation might have made the dormant infective germs active, threatening the loss of the foot and possibly the life of the patient; that the duty of the operating or attending surgeon was first to look to the life of the patient. They testified that the services of the defendant were in keeping with the proper teachings of surgery.

The reviewing court says in substance that where the unimpeached testimony of doctors of equal skill and learning disagree on a given state of facts, the courts cannot hold to the theory of one to the exclusion of the others; that if a number of witnesses recognize the method of procedure as proper and approve of it, the court could not hold the surgeon guilty of malpractice, giving reasons as follows:

That a surgeon is called upon to exercise only reasonable care, learning, and diligence in his profession, and if he uses a method recognized and approved by

members of his profession of equal learning and standing, he should not be held liable for mistakes, nor will the court deem a man guilty of malpractice where doctors disagree as to methods of treatment even though a more modern method than the one adopted is suggested as the standard. It is the duty of the attending surgeon to do all that is reasonable within the limits of professional skill to relieve pain and suffering.

The question then arises: Did the defendant in the case at bar violate any duty to the plaintiff after the plaintiff had left the hospital? The court holds that although the doctor's contract with the employer of the plaintiff terminated at the time the plaintiff left the hospital, his duty to the plaintiff was a continuing one, continuing to the limit of reasonable professional ability. It being reasonably clear that an operation was, at the time of trial, necessary and would probably relieve the suffering so far endured by the plaintiff, and evidence being offered to show that the reasonable cost of such operation would approximate \$200.00, the court therefore directed a judgment for the plaintiff of \$200.00. However, the defendant was not held liable for the pain and suffering pending an operation. The reason was that the defendant was responsible for the original injury, being only answerable for proper care and treatment, and because at the time the plaintiff left the hospital he consulted another surgeon and was advised that an operation would relieve him. He was under a legal duty to minimize his damages. It followed, therefore, that he could not recover for the continued pain and suffering, because it was his duty, if he thought he had been maltreated, to have the operation performed and bring suit for the reasonable costs thereof.

J. A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Carvalho, C.:** The Technique of a New Procedure for Subtotal Abdominal Hysterectomy in Cases of Uterine Fibroma or Inflammation of the Adnexæ. *Surg., Gynec. & Obst.*, 1916, xxii, 614.

For some time past the author has performed subtotal abdominal hysterectomies in cases of uterine fibroma or inflammation of the adnexæ by what he considers an improvement of various methods already known. The improvement in his method he claims to be founded in the fact that the circulation of the uterus and the adnexæ is controlled by means of one forceps.

The technique is as follows: After a median laparotomy incision is made, the fundus is pulled as high as possible with a hysterolab and then flexed toward the pubis.

The thumb and the index-finger of the left hand grasp the broad ligament just outside the adnexæ and seek the cervix through the walls of the vagina, ascending slowly from there to the point where the beating of the uterine vessels is felt. The right hand seizes a pair of strong long forceps with flexible points and compresses the area covered by the thumb and the index-finger of the left hand. The whole breadth of the broad ligament is thus compressed above the point of the forceps which touch the borders of the cervix, and the forceps are slowly but tightly locked to completely close the three arteries of the uterus.

The section of the broad ligaments and the cervix is carried out from left to right following the edges of the forceps. The ligature of the uterine arteries is made directly if the ends are still visible, or, if not, by a U-shaped ligature below the forceps. The funicular and the ovarian arteries are ligated in connection with the peritonization.

The peritonization is made with catgut and a pedicle needle. The needle is passed all around the stem of the *pedicle infundibulum pelvicum*; the loop is closed and the ovarian vessel ligated. Stitches are then made in a way that spirals formed by the catgut enclose both the borders of the remaining part of the broad ligament and, the forceps compressing this part, one of these spirals encloses the artery of the round ligament. When the cervix is reached the forceps are removed and the catgut pulled just as if it were a curtain string. The ligation and peritonization of the cervix and of the other half are done in the same way.

The advantages of the method are: (1) the use of few instruments; (2) the absence of bleeding; (3) the ease with which the peritonization is accomplished; and (4) the avoidance of injury to the ureters and the bladder.

**Laroque, G. P.:** The First 118 Cases of Operation for Posterior Displacement of the Uterus. *Am. J. Surg.*, 1916, xxx, 151.

In the 118 cases that furnish the basis of the author's report, suspension was performed 117 times: in 30 of the early cases by the Gilliam technique; in some by the so-called Kelly method; in a few the temporary suspension of Ochsner was used and, as a part of the treatment for extensive suppurative disease in one case, the uterus was held up as a result of shortening the broad ligaments incident to removal of pus tubes; in one case hysterectomy was performed; in 83 cases of this group the Johnston-Willis operation was employed.

This method has given complete satisfaction. It conforms to the standard principles necessary in performing suspension; it produces no abnormality and it is what the author calls the anatomic method. It is followed by the least pain during convalescence and, above all, the end-results, both as to position of the uterus and the relief of symptoms, have been perfect. All the cases have been followed at least three months and most of them examined again. Some reports have come from patients and from doctors in many cases after from three to five years. Many of the women have given birth to children since the operation without difficulty. Dilatation of the cervix was performed in all. Curettage was necessary in a goodly number of cases. Repair work, either of the cervix or perineum or both, was necessary in 58 of the 118 cases. Removal of the tube, or of an ovary, or of an ovarian cyst, in conjunction with suspension, has been recorded in 41 cases. In 4 cases myomectomy was performed for subserous fibroids. The appendix was invariably removed in every case in which the abdomen was opened to suspend the uterus unless it had been previously removed. Seventy-eight cases showed disease of the appendix. There has been no mortality either from the disease or from the operation.

EDWARD L. CORNELL.

**Kellogg, J. H.:** A Simple Method of Shortening the Round Ligaments of the Uterus for the Cure of Retroversion. *Med. Rec.*, 1916, lxxxix, 719.

The method which the author describes has been used by him for more than twenty-seven years. He has employed it in more than 1,600 cases, and many other surgeons also have used it extensively.

In this operation almost without exception a curettage is required when the uterus has been long retroverted, as a pathological condition of the endometrium is almost invariably present.

When the pelvic floor is greatly weakened, result-



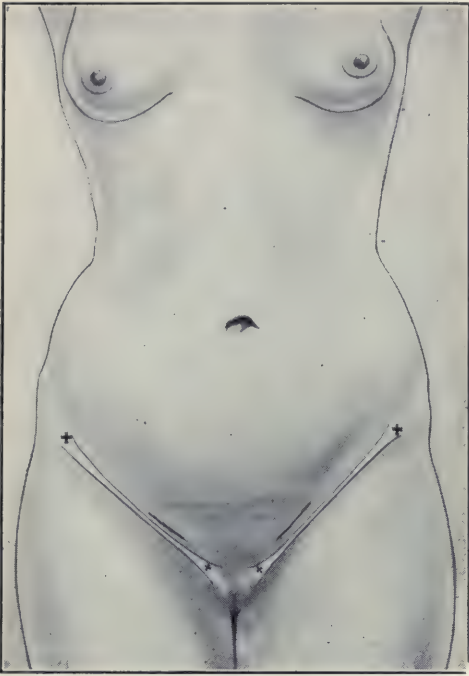


Fig. 1. Skin incision (a—a).

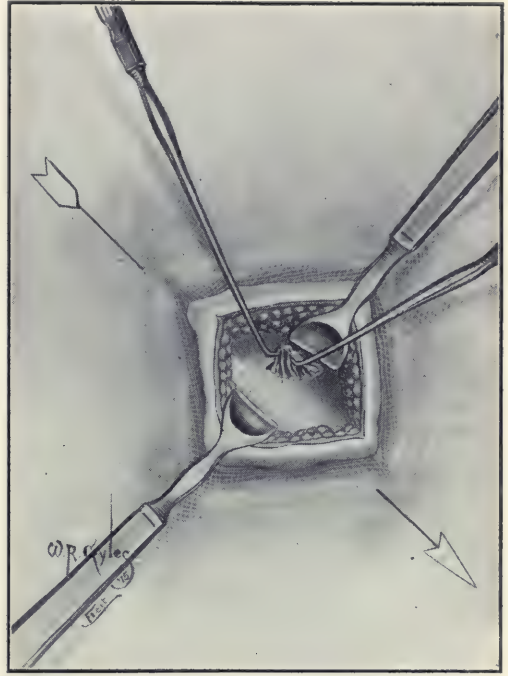


Fig. 2. Picking up ligament.

ing in rectocele or cystocele, these conditions must be corrected by a plastic operation.

Before or after the curettage the uterus is carefully replaced by bimanual manipulation. Great care must be taken to see that both the uterus and the appendages are brought well forward. When released, the uterus should remain in position. If it falls backward at once, or settles down into a retroverted position, adhesions are probably present.

When marked antelexion or retroflexion exists a stem pessary is introduced. A carefully fitted lever pessary is placed to support the fundus and to prevent all straining upon the ligaments. The pessaries are usually retained for two or three months while the intestines are becoming readjusted and the abdominal walls strengthened.

A separate incision is required for each ligament (Fig. 1), and it is important that the incision should be made at the right point. With the finger in the middle of Poupart's ligament the incision is started at a point about one centimeter nearer to the pubic spine and two centimeters internal to the ligament of Poupart.

After the skin has been incised, the remaining dissection is made entirely with the blunt hooks. The two points of the hooks are placed together in the center of the wound, pressed into the tissues, and separated by drawing toward the angles of the wound. By lifting the angles of the wound with the hooks, the wound is made to gape and the retractors are then introduced, first one, then the

other; this procedure is repeated as many times as may be necessary to reach the aponeurosis of the external oblique. When the aponeurosis first comes into sight it must be divided and drawn aside by the retractors in order to bring Poupart's ligament plainly into view.

Fixing a point along the ligament about one-third the distance from the pubic spine to the anterior superior spine of the ilium, one centimeter internal to this point, a puncture is made through the roof of the inguinal canal with the blunt hook held in the left hand and the tendinous fibers of the aponeurosis are split for about one-half centimeter and the other hook introduced with the point turned outward toward Poupart's ligament. The hook is dipped close beneath Poupart's ligament, and whatever the hook engages is carefully pulled up (Fig. 2.) If the ligament does not appear, the hook is introduced again and made to explore the tissues one or two centimeters in each direction along Poupart's ligament. If the ligament is not discovered, the hook is turned inward and an effort made to find it beneath the outer border of the internal oblique, where it is sometimes found.

The round ligament may be recognized by the following factors: (1) It is a distinct structure. (2) It differs in color from other structures, looks white like a tendon, although not quite so smooth and glistening as a tendon. (3) Over the surface of the ligament small tortuous veins may be seen which disappear when traction is made upon the ligament

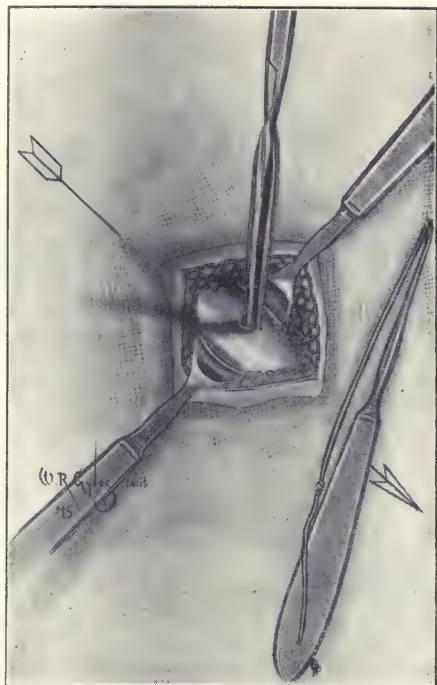


Fig. 3. Ligament fully drawn out and peritoneum stripped off.

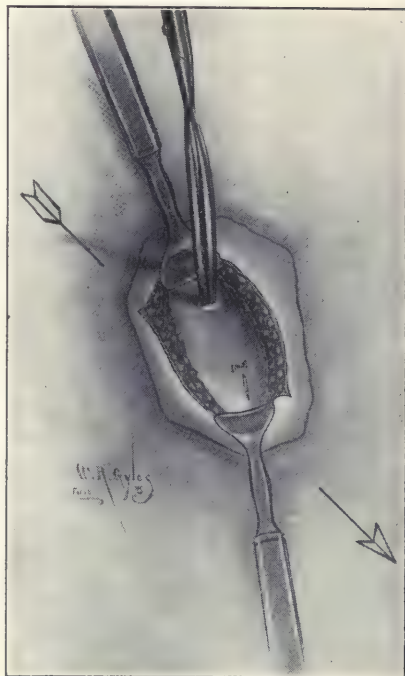


Fig. 4. Ligament drawn out above the external ring.

and fill when the tension is relaxed. It should be noted that these veins are sometimes greatly enlarged and varicose. (4) The ligament is pulled out more easily than other structures. When, however, the nerve which comes with the ligament is caught with it by the hook, the ligament is held back somewhat, but by separating or cutting the nerve the ligament may be very easily drawn up and does not snap back into the canal, as do other tissues when released.

Failure to find the ligament may be due to several causes:

1. The ligament may be drawn down under the internal oblique to an unusual degree by long continuous and excessive strain.

2. In very stout persons, the ligament may be buried in fat in the lower part of the canal.

3. The ligament is sometimes obscured by a mass of veins, due to a condition analogous to varicocele in men.

4. A more common cause of failure is incorrect placing of the incision or of the puncture through the roof of the inguinal canal. The ligament must be sought in exactly the right spot as above described. If the hook is introduced even one centimeter away from the proper point, the ligament will be found only with much difficulty.

The ligament should always be sought at the outer border of the internal oblique and should be

drawn out from under the muscle instead of being pulled up through it.

5. The ligament is sometimes so slender that its recognition is very difficult. Small ligaments are most likely to be found in poorly developed women who have not borne children and in whom the uterus is retroverted to an extreme degree.

6. The ligament is sometimes so large that it is not readily caught by the hook, and one is sometimes surprised after several minutes of fruitless search by the sudden appearance of a large, strong ligament, fully half a centimeter in diameter.

7. The ligament is sometimes invested by fascia and fat and not so easily recognizable as in normal cases.

8. Anomalous conditions of the ligament are sometimes, though very rarely, found. In 1,603 cases the author has encountered conditions which may fairly be regarded as anomalous in not more than half a dozen instances.

9. Occasionally the ligaments are held back by adhesions, the result of pelvic cellulitis involving the round ligaments.

The ligament should not be seized with forceps. Traction is made while the pouch of peritoneum, which forms the canal of Nuck, and other tissues are separated and pushed back along the ligament with narrow-bladed forceps which are not released when the peritoneum is fully stripped back but remain attached as one pair after another is used.



As the peritoneum is stripped off, the ligament may be pulled out more and more, until finally so much resistance is felt that the uterus appears to be drawn up against the abdominal wall in the suprapubic region. The ligament will be seven to nine centimeters in length, representing a shortening of fourteen to eighteen centimeters. No matter how slender the distal portion of the ligament may be, the proximal portion at the point where it emerges from the canal will show a width of half a centimeter to three centimeters.

The ligament having been fully drawn out (Fig. 3), the next step is to attach it at its thickest part to the aponeurosis of the external oblique at the upper angle of the puncture by means of a strong chromicized gut suture passed from beneath the aponeurosis. A ligature is now applied to the shreds of peritoneum held by the forceps. This closes the canal of Nuck and also ligates vessels which might be a source of trouble.

If the ligament is anchored in this position by attaching the loop of surplus ligament to the anterior surface of the external oblique muscle, the patient may possibly sooner or later develop hernia, as the small intestine will gradually work its way out alongside the round ligament. To obviate this danger the loop of ligament is drawn back into the canal and pulled up through the aponeurosis at a point five or six centimeters higher up and toward the median line. To accomplish this an aneurism needle is passed into the canal along the inner side of the ligament and made to emerge at a point five or six centimeters higher up and two or three centimeters toward the median line. About an inch of the loop of ligament is passed through the silk loop and the ligament is drawn back into the canal and up through the aponeurosis. By this means all danger of hernia is eliminated (Fig. 4).

The end of the loop of ligament is again drawn under the aponeurosis of the external oblique and made to emerge at the original opening through which it was first pulled out. Thus the surplus ligament is woven into the aponeurosis of the external oblique, to which it in a few days becomes firmly attached, forming a very secure and permanent anchorage for the ligament (Fig. 15).

The next step is to close the opening in the roof of the canal. Care is taken to pass the suture through the end of the loop of ligament so that when the opening in the aponeurosis of the external oblique is closed the ligament is closely applied to the underside. The roof of the inguinal canal is thus reinforced instead of being weakened.

The superficial fascia is closed with No. 1 plain catgut, and the edges of the skin incision are approximated by two or three skin clips.

The advantages claimed for this method of operation over other methods are:

1. The abdomen is not opened, hence there is no shock and no risk of formation of peritoneal adhesions and no abnormal conditions created which might lead to intestinal obstruction.

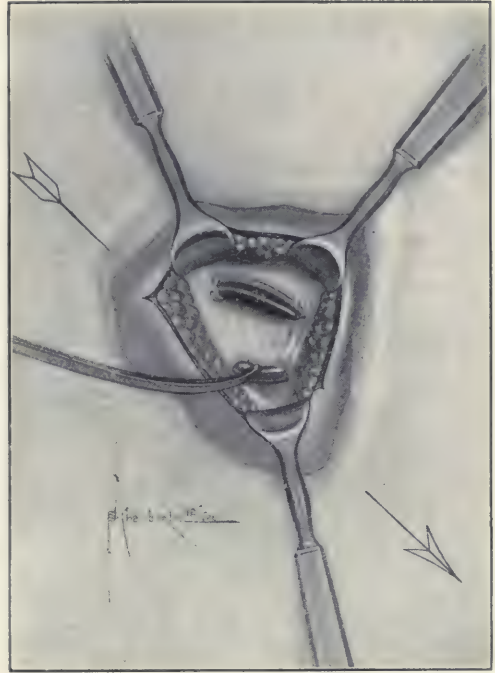


Fig. 5. End of ligament drawn out through original opening in roof of canal.

2. The ligament is so secured that the recurrence of prolapse is almost impossible. In the original method of Alexander the ligament was cut off and attached to the fascia about the spine of the pubes. This method did not give secure anchorage and frequently resulted in complete failure because the ligament tore loose.

3. The ligament is not injured and no mutilation of any sort occurs, so the patient cannot possibly be made worse, as not infrequently occurs with several other methods.

4. The technique is simple and the operation may be quickly done. The time required is rarely more than fifteen minutes and often only ten or twelve minutes for both sides.

5. The small and superficial incision and the short time occupied by the operation give no occasion for shock.

6. The operation does not give rise to complications in pregnancy as do some other methods.

7. The results, when the cases are properly selected, are better than those obtained from other methods.

Conditions which contra-indicate shortening of the round ligaments by this method are:

1. Procidencia, in which the ligaments are not strong enough to sustain the weight of the entire abdominal contents, and a more radical procedure is necessary.

2. The absence of symptoms as in cases of retroversion of long standing in which the uterus is small and free from disease, as often noted in women who have passed the menopause.

3. The presence of adhesions of the uterus, tubes, or ovaries either to the pelvic walls or to other pelvic viscera, unless very slight.

The following suggestions are made as to the after-care:

1. The patient should be kept in bed or in a reclining position most of the time for a week or two, but may sit up some, go out in a wheel chair, and walk about some each day.

2. The lever pessary applied at the time of the operation is retained for three or four months.

3. A spring abdominal supporter is adjusted when the dressings are removed and must be worn constantly, except at night, until the abdominal muscles become strong enough to support the viscera.

4. The bowels must be trained to move normally without straining. This should be accomplished before the operation.

5. The abdominal muscles must be developed to enable them to support the abdominal viscera in a normal way. This must be accomplished by systematic and carefully graduated exercises.

6. The corset and tight bands must be discarded definitely and permanently.

The patient must live the "simple life," and must make the care of the health a matter of serious and constant concern. It is especially important that she should understand that the operation alone may not effect a permanent cure, but that with her thorough co-operation it makes a permanent cure possible.

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Rosenow, E. C., and Davis, C. H.: The Bacteriology and Experimental Production of Ovaritis.**  
*J. Am. M. Ass.*, 1916, LXVI, 1175.

The authors record briefly the results of cultures made from the tissues and cystic fluid in a series of 64 ovaries removed at operation. The histories of a few illustrative cases and the results of animal experimentation made with some of the strains isolated are given.

Of 3 patients with acute tubo-ovarian abscesses, 2 showed pure cultures of streptococcus viridans in countless numbers in the involved tissues. The pus of one of these was sterile, while the other showed a moderate number of the same streptococcus. The third case yielded gonococci in large numbers. In 10 cases the cultures remained permanently sterile. In the remaining 51 cases, in which the ovaries showed the usual fibrocystic degeneration, streptococci were isolated in 29, the number of the colonies ranging from one or relatively few, usually in the depths of the ascites-dextrose agar, to hundreds, and in a few instances to countless numbers. They were present in pure culture in 7 cases and

associated in the others with the welch bacillus and a few staphylococci or colon bacilli. Welch bacilli were found in small numbers in 21 cases, diphtheroid-like bacilli in 10, a few colonies of staphylococcus albus in 9, the gonococcus in 2, the colon bacillus in 3, and an aerobic streptothrix in one.

The following facts support the view that the streptococci isolated from the chronic lesions when there was no history of a previous acute infection, as well as those causing acute infections of the ovary, are carried to these structures by the blood more often than is generally believed:

1. The occurrence of fibrocystic degeneration of the ovaries in which the usual streptococcus was isolated in pure form in a young woman with imperforate vagina.

2. The history of tonsillitis followed by symptoms of pelvic infection in a number of patients in the series.

3. The not uncommon occurrence of pelvic infection noted in gynecologic practice following anginal attacks during the menstrual period.

4. The far more frequent occurrence of so-called idiopathic streptococcal peritonitis following anginal attacks, in the female than the male, which, according to Wilder, who reviews the literature and reports a case in point, is due to the occurrence of a primary hæmatogenous ovaritis and a secondary peritonitis.

5. The absence of colon bacilli in all but three ovaries in this series, a fact contrary to expectations if local invasion occurred commonly.

6. The frequent concurrence of appendicitis, cholecystitis, and arthritis in these patients, diseases proved to be due usually to streptococci from a distant focus of infection.

The occurrence of fibrous and cystic degeneration in the ovary secondary to acute infection is already well established. But, as pointed out, the cause of this condition without an acute infection had not previously been worked out. In this work the authors have isolated streptococci, often in pure culture, and demonstrated them in the tissues in the areas showing infiltration, roughly in proportion to the amount of tissue reaction in a large proportion of the ovaries studied. Two of the strains isolated showed a marked affinity for the ovary in two species of animals — rabbit and dog — producing hæmorrhage and leucocytic infiltration (precursors of sclerotic changes) in and surrounding the graafian follicles and in the ovarian tissue stroma containing interstitial cells in the fully developed corpus luteum in a pregnant rabbit.

Hence, the conclusion seems warranted that fibrocystic degeneration of the ovary even in the absence of previous acute infection is due commonly to a low grade hæmatogenous infection by streptococci having elective affinity for these structures. Owing to the fact, however, that the number of bacteria found is relatively small and that the experimental lesions in the ovary are not due to an overwhelming growth, it is clear that while excision



and resection of ovaries is indicated in some instances, it should no longer be done without due regard for the existence of chronic foci of infection which may serve not only as the place of entrance but also as the place for the bacteria to acquire the peculiar properties necessary to infect the ovary. There is little indication for the removal of this type of ovary with the idea that it may play the rôle of a secondary focus of infection, yet the second case in the series indicates that this at times is possible. The results suggest, however, that the early eradication of primary foci of infection in this type of patient might in some cases prevent the premature sclerotic degeneration of the ovary.

**McGlenn, J. A.: The End-Result of Resection of the Ovaries for Microcystic Disease.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 435.

From his own experience and that of other operators the author concludes that there is nothing to be gained by resecting the ovary which has undergone small cystic degeneration. He believes that resection tends to make the condition worse and either removes the more diseased ovary or simply punctures the cysts which are near the surface. The associated pathology in the pelvis must also be cleaned up. Following the operation the patients are treated to relieve pelvic congestion and if possible to prevent its future development. Five brief histories are given to show the futility of resecting the ovaries.

C. H. DAVIS.

**Llewellyn, T. H., and Block, F. B.: Hydrops Tubæ Profluens.** *J. Am. M. Ass.*, 1916, lvi, 1018.

The patient was a very stout woman, aged 33. She had been married for fourteen years, but had one child some years previous, and no miscarriages. The menstrual periods were never regular. Every other month the flow was profuse, while in the intervening month it was scanty. The previous history presented nothing of importance, except that she had had her left tube removed four years before. She complained of throbbing pains in the sacral and right ovarian regions, associated with a vaginal discharge. A short time before, while stepping from the sidewalk to the street, she felt a sharp stabbing pain in the right side and felt a sensation as though "something burst." Immediately afterward a brownish discharge issued from the vagina and has continued to do so ever since.

At operation the left ovary was found to be transformed into a follicular cyst about the size of a peach; the right tube was enlarged and contained fluid, while the right ovary seemed to be in good condition. The operation consisted of a supravaginal hysterectomy, right salpingectomy, and left oophorectomy. On examination of the pathologic specimen after the operation was completed, it was found that when gentle pressure was made on the tube, there was a flow of clear, watery fluid from the tubal ostium at the uterine cornu.

EDWARD L. CORNELL.

## EXTERNAL GENITALIA

**Salvador, J.: A Case of External Genital Deformity in a Woman Due to Retardation in Morphologic Evolution** (Un caso de deformación genital externa en la mujer por detención en la evolución morfológica). *Semaine méd.*, 1916, xxiii, 208.

The author reports a case of external genital deformity, i.e., abnormal enlargement of the vestibular canal. The woman was 25, married four years, and a nullipara. Coitus had always been very painful. Examination showed her to be a well-formed woman with a vestibular canal abnormally developed from the anterior part of the urogenital tract and with a perforate unruptured hymen, without other visible abnormality. The vulva was that of a nullipara. The vagina was short, only 6 cm., but very wide. There was no apparent hymen nor nymphohymeneal sulcus; there was no extension from the navicular fossa. The hymen was situated deeply within the vestibular canal and abnormally developed in front, the vaginal canal being behind it.

The immediate cause of the anatomic conditions giving rise to this deformity was retardation in morphologic evolution (according to Pozzi) and not interruption in the organic growth. The organ represents a foetal type but without aplasia. It is due to a pathologic intervention during embryonic life.

On account of this abnormal condition conjugal relations were incomplete and painful and the woman was in a hopeless state of sterility. Added to this she had for the past two years been annoyed by an abundant mucopurulent leucorrhœa.

The treatment indicated was surgical and the author made a hymenotomy followed by a double colpoplasty with good results. However, he is of the opinion that if pregnancy should result and go to term the stricture of a portion of the vaginal canal would undoubtedly cause dystocia.

W. A. BRENNAN.

**Young, E. B.: A Simple After-Treatment for Perineal Wounds.** *Boston M. & S. J.*, 1916, clxiv, 651.

The method at the Boston City Hospital has been used for nearly ten years and has been generally adopted for some time as the standard treatment. The aim is to maintain the greatest possible degree of cleanliness and dryness, as under such conditions infection and irritation are least likely to occur.

After twenty-four hours, when the bleeding has ceased, the gauze perineal pad is omitted and the genitals and fissure between the buttocks kept liberally covered with a drying and antiseptic powder. For this purpose various mixtures have been used, the best being the compound stearate of zinc with boric acid. Results have been good with the stearate of zinc alone, but rather better with the boric acid added as there is less tendency to decomposition of whatever discharge may come from the wound or elsewhere. The great advantage of

the stearate of zinc is that it sheds water and keeps the parts dry. In practice it has been found that mixtures of stearate of zinc and boric acid made by the physician are not so satisfactory as those prepared by the pharmaceutical firms.

The powder is best applied with the patient lying on the side, the upper buttock being raised and the powder thrown into every fold. It is not sufficient to dust lightly or use the powder blower. The parts must be thickly covered, especially between the buttocks, and kept so throughout the healing if the best results are to be obtained. Although the powder gradually becomes moist, it gives excellent protection to the skin, is mildly antiseptic, and sheds water to an amazing degree. With reasonable care it is usually possible to maintain absolute dryness.

If, as occasionally happens, there is considerable tendency to moisture and maceration of the skin, the application of a 10 per cent aqueous solution of ichthol before dusting with the powder will be found effective.

The patient, free from any dressing, lies upon a small pad which collects any discharge from the vagina or elsewhere and can be changed whenever necessary. The genitals are carefully washed after urination and defecation and as often as may otherwise seem necessary.

The advantages claimed for this method of treatment are dryness of the parts and hence less tendency to irritation and infection. There is also no perineal dressing to increase perspiration, absorb discharges, and form a poultice.

EDWARD L. CORNELL.

#### MISCELLANEOUS

**Barnes, F. M., Jr.: Psychiatry and Gynecology.** *Surg., Gynec. & Obst.*, 1916, xxii, 579.

The origin of the belief in the causal relationship of genital to mental disorder, a review of the theories which have been advanced in explanation of the character of such relationship, and an analysis of the data which has been presented in support of such theories are considered. Absolutely contradictory views have been held at different periods and the full gamut has been run from advisement of complete oophorectomy in genitally normal females to non-operative treatment in females with demonstrable genital disease. Of the various theories which have been proposed the toxic and endocrinic are today receiving the greatest attention.

The facts available do not warrant the assumption that diseases of the ovary or disorders of its internal secretion are in themselves responsible for the production of any psychosis. Statistics do not bear out the contention that gynecologic disease deserves the importance credited to it by some. The vast majority of mental cures reported have occurred in psychoses which were more or less acute and self-limited. Where operative indications exist, and it is now the consensus of opinion that these are

the same in the insane as the sane, the results obtained by operation have been considered apart from the possible effect of such measures as are instituted during the period of post-operative care.

Although the menstrual period is accompanied normally by a certain group of phenomena referable in part to alterations of function of the nervous system and although these are sometimes exaggerated in so-called "nervous women," it has not been shown that menstruation itself is the cause of a psychosis. The calm judgment of the majority, both psychiatrists and gynecologists, tends at present strongly to the belief that a cause of insanity is not to be found in female genital disease or dysfunction, and that gynecological treatment, even where indicated by the gynecological condition, cannot be recommended as a cure for psychoses.

**Tuley, H. E.: Hydatidiform Mole.** *Louisville Month. J.*, 1916, xxii, 339.

The author reports a case of hydatidiform mole occurring in a primipara 27 years old. The last regular menstruation occurred July 27, and the usual early symptoms of pregnancy were noted. A slight flow began in September, and continued until the mole was expelled. In November the fundus was two finger-breadths below the umbilicus, the cervix was soft, and the uterus had a decidedly boggy feel. On December 7 the mole was expelled. No fetus was found. There was no operative treatment, but the patient is being kept under close observation on account of the possibility of deciduoma malignum following a case of vesicular mole. This point was emphasized in the discussion. The anomalous features of this case were that there had been no excessive hæmorrhage and no cysts had been expelled. It was further pointed out that normal pregnancy and labor can occur after the expulsion of such a cyst.

C. D. HAUCH.

**Vignes, H.: Experimental Researches on the Mechanism of Menstruation** (*Recherches sur le mécanisme de la menstruation*). *Ann. de gynéc. et d'obst.*, 1916, xlii, 104.

From Vignes' experiments both *in vitro* and on living animals he finds that the ovule attracts to itself a certain number of heterogenous and auto-genous toxic substances. Certain of these substances are necessary for the development of the ovule. However, the method of their production is not known.

In whatever way the phenomena of ovulation are produced, there is produced at the same time modification of the uterine mucosa which prepares it for nidation. If this is not effected menstrual hæmorrhage is produced and this hæmorrhage carries off at once all the reserves prepared for the early stages of development.

Menstruation is not only a cellular abortion, the abortion of an ovule, but it is a chemical abortion.

W. A. BRENNAN.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Montgomery, E. E.: Recognition and Treatment of Ectopic Gestation.** *Illinois M. J.*, 1916, xxix, 254.

The general practitioner should be so trained that the concurrence of sudden abdominal pain, shock, faintness, feeble pulse, and symptoms of profound anæmia will awaken the suspicion of internal hæmorrhage, and this should govern his procedure in treatment.

The physician so trained will not ply such a patient with stimulants, but rather administer a sedative, for he will remember that the vessel is open and that the only hope for relief, outside its direct control by clamp or ligature, is through the formation of a clot, whose further action increased blood-pressure would imperil.

As it cannot be assumed in any case that the clotting will be effective in the control of the hæmorrhage, the greatest certainty is through efficient closure of the bleeding vessel by its ligation, and measures should be employed to secure this under the most favorable circumstances.

Where it is not practicable to secure immediate surgical relief, the patient should be placed under the influence of morphine and kept free from annoyance until she can be placed in a proper environment for surgical measures.

Immediately preceding or simultaneously with the incision of the abdomen, active stimulation, the most efficient of which is the intravenous transfusion of saline solution to which adrenalin has been added, should be begun and continued during the operative procedure, by which any additional shock through operation is more than counteracted.

Even though it is apparent that operation is not needed to ensure against further hæmorrhage, to open the abdomen is advisable for the removal of large quantities of clotted blood, as the forces of the patient are relieved from its care and disposal.

EDWARD L. CORNELL.

**Williams, J. T.: Cæsarean Section by the Modified Davis Operation.** *Interst. M. J.*, 1916, xxiii, 249.

Williams has abandoned the high incision in the Davis operation because of the difficulties caused by the stomach presenting in the wound during the operation and the danger of post-operative adhesions between the stomach and the abdominal scar. He feels that the dangers of such adhesions are much greater than of those between the uterus and abdominal wall. He therefore makes an incision with its center rather than its lower end at the umbilicus. In all other respects the Davis technique is closely followed. The short incision, opening the uterus *in*

*situ*, and the method of extracting the fœtus are all retained. The most important point in the technique is that the assistant shall draw the uterus up into the wound quickly after the extraction of the child in order to avoid soiling the peritoneum with blood and liquor. Using this technique the author has performed seventeen consecutive cæsarean sections in two years without a maternal death.

**Bandler, S. W.: Some Problems in Obstetrics: Cæsarean Section; High Forceps; Pituitary Extract.** *Am. J. Surg.*, 1916, xxx, 121.

The author states that by using pituitrin in proper doses and at proper intervals any uterus may be made to do the work of the best behaving, normally acting uterus. It will enable a primigravida to go through the three stages of labor within seven to ten hours. Bandler gives three to five minims as the first dose to judge the effect and follows it with one-third of an ampoule, which is repeated every half hour or so as occasion demands. When, under normal conditions with a normal presentation and a normal relationship between the head and pelvis, all that is needed is sufficient uterine force, small repeated doses of pituitary extract may be used in either the first or second stage. Three injections of a half ampoule each at half-hour intervals aid in clearing up the diagnosis of beginning parturition. Small repeated doses are also of value in supplementing the action of hydrostatic bags in the induction of labor. Bandler has used castor oil and quinine followed in a few hours by three or four doses of pituitrin with good results for the same purpose.

He divides his cases into the following classes:

1. Cases in which cæsarean section is obviously unnecessary.
  2. Cases in which cæsarean section is obviously necessary.
  3. Borderline cases, where the head is not engaged, or only moderately engaged. Cæsarean section done early in these cases is better than a long first and second stage terminated by a hard high forceps delivery.
  4. In transverse presentation with ruptured membranes and prolapsed cord, cæsarean section, to say the least, may give a living child.
  5. In eclampsia cæsarean section is advised as a general proposition.
  6. Cæsarean section is recommended in all cases of placenta prævia when the child is alive and viable.
- The author continues the use of pituitrin during the convalescence from cæsarean section during the first week or ten days in one-third ampoule doses every three to four hours, and gives ergotol in ad-

dition. He claims that it keeps the uterus well contracted, aids the muscular power of the intestines, and stimulates the breasts.

In conclusion Bandler states that in private practice he has not applied forceps in two years. He gave one patient thirty small hypodermatic injections of pituitrin and delivered her safely, untorn and without the aid of instruments. F. C. IRVING.

**Fonyo, J.: Transperitoneal Suprasymphyseal Caesarean Section on Account of Scariform Growth in the Vagina** (Transperitonealer suprasymphysaerer erhaltender Kaiserschnitt wegen totaler narbiger Verwachsung der Vagina). *Zentralbl. f. Gynaek.*, 1916, xl, No. 4.

The case reported occurred in a II-para, 24 years old, who after the first birth had suffered a complete perineal tear for which she received no treatment. The vestibule became almost entirely filled with dense, hard, scarry connective tissue with a resulting hæmatometra. The woman, however, became pregnant again and the pregnancy proceeded to term. When labor was indicated the author, having made several deep incisions (under narcosis) in the vagina, with the episiotome stretched the vagina in order to afford means for escape of the lochia. Following this, suprasymphyseal cervical caesarean section was done and the child was delivered in good condition. The tubes were ligated. The case recovered normally. W. A. BRENNAN.

**Adair, F. L.: Hæmorrhage Associated with Partial and Complete Detachment of the Normally Implanted Placenta.** *Am. J. Surg.*, 1916, xxx, 154.

Two clinical types are recognized: one with relatively concealed hæmorrhage, the other in which the bleeding is absolutely concealed *in utero*. So far as the etiology is concerned the author speaks of two groups, the mechanical and the toxic. In the former both intra- and extra-uterine trauma may produce the hæmorrhage; in the latter any toxin which produces degenerative conditions in the maternal or foetal placenta may be responsible for the bleeding.

Certain milder forms are relatively unimportant and cannot be diagnosed antepartum. In the more severe forms the symptoms to be kept in mind are pain, shock, and those manifestations associated with hæmorrhage.

There may be diffuse distention of the uterus or this may be localized producing the so-called accessory tumor.

Mensuration may show a progressively enlarging uterus.

The hæmoglobin estimation may show an increasingly severe anæmia.

One of the main conditions to be differentiated is placenta prævia. The chief differential point is the palpation of the placenta through the cervix uteri.

The objects to be accomplished by treatment are the maintenance of intra- and extra-uterine pressure throughout the early, rapid, and complete evacua-

tion of the uterus through the parturient canal if the conditions are favorable, but if not caesarean section should be performed. There should be symptomatic treatment to combat the shock and anæmia.

**Wilson, K. M.: Nitrogen Metabolism During Pregnancy.** *Bull. John Hopkins Hosp.*, 1915, xxvii, 121.

The nitrogen metabolism in three normal pregnancies was studied; in one patient for a period of four weeks from the tenth to the fourteenth week of pregnancy. The other two patients were studied for the last 133 and 101 days of their respective pregnancies and for a short time in the puerperal period.

A fairly liberal diet was allowed. Each article of food was weighed or measured before being given to the patient and any residue collected and again weighed or measured. The patients were kept under as normal conditions as possible in regard to exercise.

The urine was collected for twenty-four hour periods and daily analyses made. From these daily analyses the daily average nitrogen content of the urine for periods of a week at a time was estimated. Daily estimations of the ammonia nitrogen were made on all specimens and the amino-acid nitrogen was estimated for variable periods. The total nitrogen was determined by the Kjeldahl method, the ammonia by the method of Folen, and the aminonitrogen by the Van Slyke method. The faeces were preserved and analyzed weekly, and from the results obtained, the daily average nitrogen content was calculated. The patients were weighed at frequent intervals.

All three patients were perfectly normal with no nausea, vomiting, or other gastro-intestinal disturbance.

The conclusions drawn were as follows:

1. In the perfectly normal pregnant woman, storage of nitrogen begins at a much earlier period than has hitherto been supposed; possibly the organism may acquire the capacity for storing nitrogen from the very beginning of the pregnancy.

2. In the early months this storage is far in excess of the actual needs of the developing ovum, and the excess must be added to the general maternal organism.

3. Storage of nitrogen continues throughout the entire duration of pregnancy, being most marked during the last few weeks, when the foetal needs are at a maximum.

4. The nitrogen stored is greatly in excess of the actual needs of the developing ovum, so that, apart from the amount needed for the hypertrophy and development of the genitalia and breasts, a large proportion of the nitrogen stored is added to the general maternal organism as "rest material," though concerning the form in which this reserve is stored it is impossible to make any positive statement. The nitrogen capital of the maternal organ-



ism is thus increased, though the reserve supply may possibly be entirely exhausted during the puerperium and period of lactation.

5. In the healthy woman who goes through a normal pregnancy the period of gestation does not necessarily represent a "sacrifice of the individual for the sake of the species," but may actually be a period of gain.

6. There is a relative increase in the percentage of urinary nitrogen excreted in the form of free amino-acids, though not necessarily an absolute increase in this form of nitrogen.

7. There is also a tendency for the percentage of ammonia nitrogen to become increased during the last weeks of pregnancy, although at other times during the pregnancy there is practically no variation from the percentages noted in non-pregnant individuals upon a similar diet. D. H. BOYD.

**Kohlmann, W.: Fibroids Complicating Pregnancy.** *South M. J.*, 1916, ix, 445.

In considering the treatment of fibroids complicating pregnancy, Kohlmann classifies the cases as follows:

1. The first class includes probably the majority of cases which are without any clinical significance and do not interfere with either pregnancy or labor. The tumor may be discovered accidentally during an examination or post-partum bleeding may lead to its discovery.

2. The second class includes cases in which the fibroid causes pronounced symptoms, which may prove dangerous to the mother and foetus. In these cases enucleation of the tumors is advised.

3. The third class includes cases in which the location or size of the tumor or the associated displacement of the uterus make an expectant treatment extremely dangerous to mother and child, and in some cases a delivery through the natural channel is impossible. In such cases pregnancy should be allowed to go to term, but at the end of pregnancy or the beginning of labor radical treatment should be instituted. The operation of choice should be cesarean section with supravaginal (Porro's) or total hysterectomy.

4. The fourth class includes cases in which the progress of pregnancy would increase the suffering and even endanger the life of the patient, while abortion would be very difficult and dangerous on account of the distorted uterine channel. Even after a successful termination of one pregnancy there is danger of succeeding ones. In such cases the author advises total hysteromyomectomy of the gravid uterus, or supravaginal as recommended by Landau. L. R. GOLDSMITH.

#### LABOR AND ITS COMPLICATIONS

**Salisbury, W.: Three Cases of Labor Obstructed by Ovarian Cyst.** *Proc. Roy. Soc. Med.*, 1916, ix, *Obst. & Gynec. Sect.*, 21.

A case seen late in pregnancy or early labor is most safely treated by cesarean section. Seen

late in labor — especially if the uterus be infected — the safer course is to turn the uterus out of the abdomen, remove the cyst, and deliver the child *per vius naturales* before closing the abdomen. The method of induction of labor late in pregnancy followed by watchful waiting until dilatation is complete, then delivery by forceps or version plus ovariectomy, has two disadvantages: (1) the obstruction frequently leads to premature rupture of the membranes and unsatisfactory dilatation of the os; (2) the cyst may rupture before laparotomy has been performed. W. F. HEWITT.

#### PUERPERIUM AND ITS COMPLICATIONS

**Huxley, F. M.: Fatal Rupture of the Bladder During the Puerperium.** *Proc. Roy. Soc. Med.*, 1916, ix, *Obst. & Gynec. Sect.*, 24.

A primipara was delivered by forceps for persistent R. O. P., with omission of preliminary catheterization. On the ninth day the patient was attacked with severe abdominal pain, vomiting, and collapse. Post-mortem examination showed free urine in the abdomen, bladder thinned and adherent, slit 2.5 inches long at the fundus of the bladder, the edges of the slit being jagged and sharp. The rupture was probably due to pressure during delivery on the distended bladder. This pressure produced an atony of bladder musculature so that distention was not overcome. Strong abdominal contraction at the time of movement was sufficient to produce the rupture. W. F. HEWITT.

**Porritt, N.: The Treatment of Puerperal Sepsis by Uterine Suction and Drainage.** *Brit. M. J.*, 1916, i, 716.

The suction tube has all the advantages with none of the dangers of the uterine douche. In at least two cases the author has seen the uterine douche convert a smart sapræmia into a rapidly fatal general infection, while in another case it set up an acute, presumably chemical, peritonitis.

Three cases are reported in which the uterine contents were removed. The following instruments were used:

A glass Budin catheter, to which the inlet end of a Higginson enema syringe was attached, was passed into the uterus. To secure the syringe to the Budin catheter, the inlet valve was removed. The tube of the syringe between the bulb and the catheter was held firmly and the bulb squeezed so as to drive out the contained air through the nozzle. On releasing the pressure on the bulb, the valve behind the nozzle closed and prevented the return of the air. There was then a vacuum in the syringe, and, on releasing the pressure on the tube between the bulb and the Budin catheter, suction was exerted through the catheter within the uterus. No air was drawn into the uterus, although the suction drew into the orifices of the catheter thick, grumous, semipurulent masses which were too large to pass through and, when the catheter

was withdrawn, came with it. Reintroduction of the catheter and suction drew out more of these thick pieces.

Uterine suction discloses the condition in the interior of the uterus. It is most instructive to watch the gradual alteration of the matter withdrawn from a thick, offensive fluid, loaded with semisolid purulent masses, to a clear red liquid and from that to an inoffensive mucus. Moreover, it prevents the physician from being misled by the deceptive character of the discharge found upon the pad. The pad may be covered with discharge which may be only an overflow or may not come from the penthouse in the uterus at all, for there may be odorless discharge on the pad and foul, foetid fluid in the uterus. Efficient drainage of the uterus is the key to successful treatment of puerperal sepsis.

Two of the three cases reported recovered.

EDWARD L. CORNELL.

**Mitchell, A. G.: The Duration of the Nursing Period in Women of the United States. J. Am. M. Ass., 1916, lxvi, 1690.**

An analysis is presented of almost 3,000 cases taken from the records of the Children's Hospital, Philadelphia, during the last fifteen years. As it was the desire to determine, as far as possible, the ability of the mother to nurse, many cases were excluded. It was the duration of the physiologic period of lactation, apart from disease or deliberate act of the mother, which was the problem to be solved. Thus, when the records showed that the mother stopped nursing from some such cause as going to work, or lactation was terminated by an acute infection or mammary abscess, the case was not included.

It may certainly be stated, however, that the statistics to be presented show with reasonable accuracy the length of breast feeding in the hospital class of Philadelphia women. These women are of different nationalities, including Italian, German, Russian, Armenian, Irish, and others. Many of them are native-born Americans, and a fairly large percentage consist of Jewish and colored women.

From the beginning of 1900 to the end of 1904 there were 734 cases in which the average length of lactation was 5.92 months. From the beginning of 1905 to the end of 1909 there were 827 cases with an average of 6.36 months. From the beginning of 1910 to the end of 1914 there were 1,258 cases with an average of 5.76 months; therefore, of a total of 2,819 cases during the fifteen years, the average length of lactation was 6 months.

If it is borne in mind that this is a study of the statements of the poorer class of city women, the following conclusions may be justly drawn:

- 1. There has been no decline in breast-feeding in the last 15 years.
- 2. The women of the poorer class compare favorably in the period of lactation with the women of the more prosperous class in this country.

3. The women of this country compare favorably as to the period of lactation with European women.

4. The average period of lactation in children entered at the hospital was 6 months.

5. Twenty per cent of the women did not nurse their children; 80 per cent nursed one week or longer; 55 per cent nursed three months or longer; 42 per cent nursed six months or longer; 34 per cent nursed nine months or longer; 27 per cent nursed a year or longer; 9 per cent nursed eighteen months or longer; and 2 per cent nursed two years.

6. For the reason that artificially fed babies are more susceptible to gastro-intestinal and nutritional disturbance, the infants brought to the hospital were, in the large majority of cases, bottle-fed at the time of their entrance there. The conclusion is inevitable that the figures given represent the minimum of lactation.

Table 1 shows a study of the statements of 2,819 mothers when questioned regarding the length of time their children were breast fed.

Period of Breast-feeding in Months	1900-1904 Per Cent	1905-1909 Per Cent	1910-1914 Per Cent	1900-1914 Per Cent
Not breast fed...	21.117	18.256	19.713	19.695
1 week to 1 mo...	14.033	14.749	16.136	14.972
1 to 2.....	9.537	10.035	11.023	10.408
2 to 3.....	6.948	7.858	5.882	6.896
3 to 4.....	3.267	2.780	3.338	3.128
4 to 5.....	2.997	3.022	2.305	2.775
5 to 6.....	4.032	3.868	2.940	3.813
6 to 7.....	1.634	1.934	2.140	1.905
7 to 8.....	2.725	2.539	2.140	2.470
8 to 9.....	3.133	2.781	2.305	2.739
9 to 10.....	2.129	1.692	1.669	1.841
10 to 11.....	1.362	3.022	1.510	1.965
11 to 12.....	7.084	8.342	8.982	8.136
12 to 13.....	1.908	2.901	1.826	2.212
13 to 14.....	1.908	4.473	2.225	2.865
14 to 15.....	3.267	2.418	2.140	2.610
15 to 16.....	1.498	1.088	1.510	1.365
16 to 17.....	0.954	0.605	1.258	0.939
17 to 18.....	5.177	4.715	5.087	4.993
18 to 19.....	0.545	0.249	0.556	0.450
19 to 20.....	0.817	0.249	0.715	0.593
20 to 21.....	0.545	0.121	0.476	0.381
21 to 22.....	0.408	0.121	0.318	0.282
22 to 23.....	0.136	0.121	0.159	0.138
23 to 24.....	1.908	1.572	2.702	2.061
Over 24 months...	0.272	0.487	0.397	0.385

EDWARD L. CORNELL.

MISCELLANEOUS

**Gentili, A.: Histochemical Research Regarding the Function of the Decidua (Indagini istochimiche riguardante la funzione della decidua). Ann. di ostet. e ginec., 1916, xxxviii, 81.**

As the results of his researches on human and animal decidua Gentili finds that the decidual cells possess an essential function, the elaboration of lipid substances belonging to the group of phosphates.

The lipoidean function is in clear and precise correlation with the cellular vitality. If these elements are defective either there is a lack of lipid production or it passes into true fatty degeneration. The disposition of lipoids among the protoplasm and the presence of granules of this substance in the intercellular spaces indicate the method of elimination followed by the lipoids.

W. A. BRENNAN.



**Ireata, D.: Analgesics in Parturition; Clinical and Experimental Contribution** (Los analgesicos en el parto; contribucion clinica y experimental). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 93.

The author has carried out extensive clinical investigations on parturient women, supplemented by animal experiments, in an endeavor to determine the action of morphia, pantopon, hydrate of chloral, etc., on the physiological progress of parturition.

Hysterographic methods were formerly employed, but the older apparatus in which the uterine movements were transmitted from within the uterus have been discarded in favor of external hysterography, the movements being transmitted from the abdominal wall in the region of the uterine fundus and beyond the influence of respiratory action. The transmitted movements are registered on a revolving drum.

The results as summed up by the author are as follows:

1. The toxic dose of morphine for guinea pigs may be taken as 0.0005 gr. per gram weight of the animal.

2. Hypophysary solutions do not dis-intoxicate morphine.

3. Maltose ferments not only do not dis-intoxicate morphine, but appear to increase its toxic power in animals.

4. The physiologic action of analgesics and parto-analgesics upon the arterial pressure and the uterus is equal to that of morphine.

5. The union of large doses of morphine to small doses of hypophysary extract annuls the oxytocic action.

6. Solutions of malt ferments have an oxytocic action although more ephemeral than those of the hypophysis.

7. The general opinion that pain and efforts are factors which are opposed to morphine intoxication is without foundation. The properties of morphine injected during pregnancy may be transferred without modification to the foetal circulation. Sensibility to the toxic action of morphine is greater in the infant. Personal susceptibility toward morphine varies greatly with the subject. In 49 per cent of the cases there was not sufficient sedation of the labor pains to justify the use of large doses of morphine.

8. Products with a morphine base destined to produce analgesia are inconstant in their action, and injection of such substances during the expulsion period have little effect; moreover, their administration in cases of obstetrical intervention is not only useless but prejudicial.

9. Derivatives of opium like all analgesics do not lessen the pains of labor, but alter the uterine dynamics because they diminish the number and intensity of the contractions. Compositions with a morphine base may intoxicate without lessening labor pains.

10. Generally the dilatation and expulsion periods are prolonged in analgesized parturients. The duration of labor may be 19 hours in multiparæ and 24 hours in primiparæ. Artificial rupture of the membranes must be resorted to more frequently in analgesized women; likewise with obstetrical intervention.

11. Opium derivatives, used as analgesics, intoxicate in varying degrees, 38.5 per cent of the foetuses, and may occasion death. Chloroform *à la Reine* is the method of obtaining an innocuous analgesia in parturition and should be used in preference to all anodynes.

W. A. BRENNAN.

**Regnault, I.: Choice of an Anæsthetic and General Analgesic in Surgery and in Obstetrics** (Du choix d'un anésthésique et d'un "analgésique général" en chirurgie et en obstétrique). *Prog. méd.*, 1916, xliii, 59.

Regnault favors the use of chloretlylated chloroform for which he claims that analgesia appears before complete loss of consciousness and persists in the half-conscious state; moreover, there is diminution of the danger of laryngeal syncope, rapid anæsthesia almost always without excitation, considerable diminution of the quantity of chloroform necessary to maintain anæsthesia, rapid awakening, and habitual absence of vomiting.

W. A. BRENNAN.

**Walker, J.: The Technique at the Jewish Maternity Hospital and Its Results.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 429.

The author outlines the general management of patients at the Jewish Maternity Hospital, and states that they have found the following rules necessary to good results:

1. All deliveries shall be conducted on the same basis as a surgical operation: sterile draping of the patient and proper preparation, proper cleansing of the operator's hands, and the use of a sterile gown and gloves.

2. Making the smallest number of vaginal examinations, limiting oneself to one or two, and depending a good deal on external palpation for general information, and the use of rectal examination for definite information.

3. By allowing the patient to have the proper test of labor and eliminating meddlesome obstetrics.

4. The careful watching of the foetal heart sounds and uterine contractions by an intelligent nurse, thus saving children which otherwise would be stillborn.

5. The more restricted use of pituitrin to cases in which full indications exist.

6. All cases showing a temperature above 99.3° should be regarded as suspicious, and be isolated until proved otherwise.

C. H. DAVIS.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Shannon, W. R.: Experimental Cloudy Swelling of the Kidney in the Rabbit. *J. Lab. & Clin. Med.*, 1916, i, 541.**

Shannon defines Virchow's cloudy swelling (*truebe Schwellung*, 1858) of the kidney and quotes the opinion of others regarding albuminous granules and darkened tubuli.

Claiming that "turbidity and swelling of an organ are not always associated with increase of albuminous granules, yet, on the other hand, there may be a marked increase of albuminous granules in the cells without the presence of turbidity or swelling," an experimental study on rabbits was undertaken.

1. In the first experiment compensatory circulatory increase was produced by unilateral nephrectomy or ureteral ligation with removal of the other kidney in forty-eight hours.

2. In the second experiment chemical irritants (tartrates) were injected subcutaneously, and the kidneys were removed two to forty-eight hours thereafter.

In the third experiment, autolyzed liver solution was injected intraperitoneally. In eighteen hours one kidney was removed; the other was removed after the death of the animal.

In the fourth experiment infection was produced by injecting cultures from pasteurella abscesses. The kidneys were removed from the rabbits during the different stages of infection, thus getting the different degrees of the cloudy swelling.

The summary of the findings are as follows:

1. The normal rabbit kidney always contains, in the convoluted tubules, coarse albuminous granules. Usually these granules are so numerous in a few tubules that they appear dark in the fresh tissue. The granules are apparently thin-walled vesicles filled with fluid. They are best fixed by solutions containing formalin. They are not fixed in solutions containing acetic acid.

2. When one kidney is removed the dark tubules are increased in the opposite kidney during the first twenty-four or forty-eight hours, but the increase of albuminous granules is not sufficient to cause any definite change in the gross appearance of the kidney.

3. Subcutaneous injections of tartrates produce a swollen, cloudy kidney, but there is no increase of albuminous granules. The cloudiness and swelling are apparently due to oedema, anæmia, tissue disintegration, etc.

4. Intraperitoneal injections of autolyzed liver tissue produce a markedly cloudy and swollen kidney. The albuminous granules disappear en-

tirely. The gross changes are apparently due to the same factors concerned in the tartrate experiments.

5. Chronic suppurative processes attended with marked emaciation cause an enormous increase of albuminous granules in the kidneys. These granules are often larger than the normal and irregular in shape, but they seem to have the same chemical composition.

6. Acute toxæmias cause a rapid disappearance of the normal albuminous granules.

7. An acute toxæmia superimposed upon a chronic suppurative process causes a disappearance of the albuminous granules.

8. Kidneys which show an enormous increase of albuminous granules usually give a normal phthalain output, and the cells are usually intact. This form of cloudy swelling is therefore probably not a degenerative change, but a physiological response to an increase of protein waste products in the blood.

9. There is no relation between the formation of albuminous granules and fatty metamorphosis.

10. It is suggested that the term cloudy swelling be discarded and that the several processes producing this appearance be considered separately.

C. E. BARNETT.

**Newman, D.: Pyuria, a Symptom; Its Causes and Diagnosis. *Glasgow M. J.*, 1916, lxxv, 161.**

Pyuria is a symptom of many different lesions. Pus may emanate from any point of the urinary tract, from the kidney to the urethral meatus. In every case of pyuria the important facts to determine are: the nature of the infection, the location of the lesion, and the extent of harm which has resulted from the invasion.

To discover the presence of pus in the urine is important, but to trace the cause and recognize the particular lesion producing the pyuria is necessary before any intelligent and effective treatment can be undertaken. Pyuria is nearly always due to bacterial infection. In some cases the organisms are abundant and easily found and cultivated; in others, e.g., tuberculosis and gonococcal infection, they may be hard to find and difficult or impossible to cultivate. All so-called sterile pyurias are indicative of quiescent tuberculosis.

The reaction has been considered a guide to the place from which the pus comes, acidity pointing to renal and alkalinity to vesical origin. There is no foundation for this widespread belief. The reaction in these cases depends upon the organisms present. The organisms associated with acid pyuria are bacillus coli, tubercle bacillus, streptococcus



pyogenes, pneumococcus, bacillus typhosus, and pyogenic cocci. The organisms which decompose urea and which therefore are found in alkaline urine are: staphylococcus pyogenes aureus and albus, gonococcus, and bacillus proteus. In general it may be said that of all infections of the urinary tract, in one-third of the cases the reaction is alkaline and in two-thirds acid.

Following a brief discussion of the subject the author states that as a result of experimental inquiry the following assertions may be made:

1. Simple retention of the urine does not give rise to septic inflammation.

2. Small cultures of pyogenic micro-organisms, such as staphylococcus pyogenes aureus, staphylococcus pyogenes albus, tubercle bacillus, or bacillus coli communis, when introduced into a healthy bladder fail to produce sepsis.

3. If the mucous membrane of the bladder be injured or diseased prior to the introduction of micro-organisms, sepsis immediately occurs.

4. If the artificial retention of the urine is induced from six to twenty hours after the introduction of a septic organism into the bladder, suppurative inflammation of the mucous membrane follows.

The avenues of invasion are by the blood, the lymphatics, along the lumina of the excretory ducts, and by continuity and through wounds.

The septic renal diseases are classified as follows:

1. Purulent embolic nephritis, a descending septic and suppurative lesion of the kidney, without pre-existing disease of the conducting and collecting portions of the urinary tract, the septic virus being conveyed to the kidney by the blood.

2. Purulent interstitial nephritis, an ascending interstitial nephritis, infection being by the lymphatics, from a primary septic focus in the lower urinary passages.

3. Acute septic nephritis without suppuration, an ascending septic lesion of the kidney without suppuration, the virus being carried to the kidney (most commonly to the cortex) by the lymphatics.

4. Pyelonephritis, suppurative nephritis with the antecedent septic diseases of the pelvis, the secondary foci in the parenchyma of the kidney being always due to direct contamination through the uriniferous tubules and lymphatics.

5. Pyelitis, suppurative disease of the mucous membrane of the pelvis, without distention of the cavity.

6. Pyonephrosis, accumulation of pus or of purulent urine in the pelvis of the kidney, the accumulation being a result of mechanical obstruction, with atrophy of the renal tissue, but without secondary infective foci or independent accumulations of pus in the parenchyma of the organ.

In inflammation of the bladder the two most frequent sources of infection are the intestines and the urethra. Three modes of infection are enumerated:

1. Ascending infection by way of the urethra, which for obvious reasons is more common in

women than in men, for example, in gonorrhoeal and colon bacillus infection.

2. Descending infection, or hæmatogenous infection, where the organisms are conveyed from a primary focus to the urinary tract by the blood and are excreted by the kidney. This happens in tuberculosis, in typhoid, and in colon bacillus infections.

In addition to detecting the presence of pus in the urine, the clinician must determine the underlying causative micro-organism. Their presence is revealed by the microscope, their identity by cultivation and inoculation experiments on animals.

In the majority of cases the infection is, in the first instance, pure and becomes mixed only after instruments have been carelessly employed. The author discusses at some length the various bacteria associated with infection of the urinary tract.

In considering the presence of toxins and albumin in the urine of pyuria it is noted that most of the symptoms arise from the harmful effects of toxins which give rise to painful affections simulating lumbago, rheumatism, gall-stones, renal, and vesical calculi. These symptoms diminish or disappear on the employment of a vaccine prepared from the organism isolated from the urine, even though no effect upon the quantity of pus or number of organisms is noticeable.

In cases of marked pyuria, albumin is constant, due to the presence of pus. It has been found by observation that 100,000 pus-cells per ccm. accounts for 1 per cent of albumin, and so downward in proportion. Below 10,000 pus-cells per ccm. the urine shows only a trace of albumin unless there is some renal disease.

The author quotes Sir Lauder Brunton on the different kinds of albuminuria and by way of comment adds that the latter in his classification takes no account of those cases in which albumin is added to the urine after it has escaped from the kidneys. This "extra-renal" albuminuria is accepted by many authors. When operative interference is contemplated it is of great importance to clear up the following points:

1. Is albuminuria entirely due to pus in the urine?

2. Is the albumin derived from the kidney or from the lower urinary tract?

3. If derived from the kidney, is the albuminuria due to Bright's disease, or is it a result of other causes?

H. A. FOWLER.

**Webster, J. C.: Some Observations on Pyelitis in Pregnancy.** *Urol. & Cutan. Rev.*, 1916, xx, 241.

The author does not believe that pregnant women are more prone to pyelitis than those who have never been pregnant.

The following facts are indisputable as regards pyelitis in pregnancy:

1. The disease usually begins between the fifth and eighth months of gestation.

2. The colon bacillus is the infecting organism in the great majority of cases. This is also true of non-pregnant women.

3. In a majority of cases the disease occurs on the right side, though it may be bilateral or limited to the left side.

Various speculations are advanced regarding the special influences exerted by pregnancy in causing pyelitis. Although it is possible for the pregnant uterus to so mould itself as to exert direct pressure on the ureters, we have absolutely no exact knowledge as to the frequency or the degree of obstruction to the flow of urine in the ureters.

Dilatation of the ureters and renal pelvis may be found in pregnant women at autopsy or operation, but the condition may have existed prior to pregnancy. Interference with the ureters such as is produced by pelvic tumors is comparatively rarely associated with pyelitis. Moreover, in a very considerable percentage of cases of hydro-ureter no pyelitis is found. In those cases in which there is the greatest intra-abdominal pressure, e.g., primiparity, hydramnios, twin pregnancy, tumors, and pregnancy there is no greater tendency to pyelitis than in other gestation cases.

As to the greater frequency of right-sided pyelitis, without ureteral catheterization no one is competent to judge whether one or both sides are affected, as pain on one side only is no proof that the other side may not be affected. Nor does the pressure of the iliac vessels explain it. Dextroversion or dextrotorsion hardly explain it either, for unless there is a very lax abdominal wall no appreciable movement of the pregnant uterus in advanced pregnancy can take place, and then it tends to fall forward when the woman is erect.

The greater mobility of the right kidney in non-pregnant women which leads to a dilatation of the renal pelvis may cause the development of pyelitis by micro-organisms. Colon bacilli are the most common organisms found in pyelitis. As to the mode of entrance of the organism the following views are held:

1. From the vulva through the urethra, bladder, and ureter, probably rare.
2. Lymphatic extension from infected bladder. This is difficult to prove and must be rare.
3. The most common source is undoubtedly the large intestine, either by direct lymphatic extension or by the blood stream.
4. Distant focal infections, especially those due to streptococci and staphylococci, may cause pyelitis by blood transmission though definite proof has not been established.

The symptoms and signs of the disease are the same as in non-pregnant women. In some cases the patient may complain only of malaise and slight fever without pain. The fever may be high and may be accompanied by chills. There is often aching in the loins. Frequently attention is first called to a pain in the affected side accompanied by fever, nausea, or vomiting. In some cases there is frequency of urination. Rarely is there actual bladder distress except where the viscus is involved. Right-sided pyelitis may simulate appendicitis or

even gall-bladder disease, and serious mistakes in diagnosis may be avoided if this is borne in mind.

As to treatment: Rest in bed, soft non-irritating diet, free fluids, and urinary antiseptics are most widely employed and will suffice for a large percentage of cases. Autogenous vaccine has been disappointing. Irrigation of the kidney pelvis through the cystoscope has also been unsatisfactory.

C. C. O'CROWLEY.

**Smith, E. O.: Diagnosis and Treatment of Renal Tuberculosis.** *W. Virg. M. J.*, 1916, x, 327.

The cystoscope has demonstrated that urinary tuberculosis is usually a primary kidney lesion. It is found in 4 per cent of all autopsies, and in about 20 per cent of all autopsies made on subjects that die from tuberculosis in other organs. The miliary form is usually found in children and young adults, while the caseocavernous varieties are more common in later life.

The route of entry is by the arterial blood stream. Infection by way of the ureter where the bacilli would have to travel against the stream, and by way of the lymphatics—there are no afferent lymph-vessels to the kidney—is generally discredited. A normal kidney will excrete tubercle bacilli, but in the presence of a pathological condition of either kidney or ureter a tuberculosis focus may originate, with serious results.

Some writers believe that the glomerulus is the site of onset, while Wildbolz and Wegelin found the papillæ the most common point. Several of the author's cases showed destruction in the pyramidal areas, having apparently advanced from the papillæ and calyx. Only a small area may be involved, the remainder functioning; but the entire organ may be broken down, forming a pocket of pus and necrotic tissue. There is usually a mixed infection.

The symptoms are indefinite and cover a long period of time. Bladder symptoms are first. Frequency and pain during urination increase in direct proportion to the length of time involved. Pain in the lumbar region, unless the ureter is partially or completely blocked, the palpation of a mass, pyuria, hæmaturia, and the presence of tubercle bacilli easily found indicate an advanced condition. The onset is insidious. Intermittent hæmaturia and acid urine containing pus should be closely investigated. Guinea-pig inoculation is valuable, but it takes time. Diagnosis is made by finding tubercle bacilli in the catheterized kidney urine. Repeated examinations are usually necessary. The various general tests are not of much value in localizing a focus.

When one kidney is involved, complete removal is indicated. The ureter should be thoroughly cauterized to prevent infection of the surrounding tissue. The instillation of 10 per cent iodoform in liquid alboline or vesical irrigations of bichloride 1:8,000 to 1:15,000 will in time relieve the bladder inflammation and symptoms.



In conclusion the following points are emphasized:

1. Frequent, persistent micturition is often the earliest symptom of renal tuberculosis.
2. Intermittent renal hæmorrhage is frequently of tuberculous origin.
3. Acid urine containing pus-cells which does not culture out bacterial colonies is usually due to renal tuberculosis.
4. Many cases require repeated examinations for tubercle bacilli, even necessitating a tuberculin reaction to establish a diagnosis.
5. The earlier nephrectomy is done, the better it is for the patient.

C. D. PICKRELL.

**Macht, D. I.: The Pharmacology of the Ureter; Action of Drugs Affecting the Sacral Autonomics.** *J. Pharmacol. & Exp. Med.*, 1916, viii, 261.

Macht has added materially to our knowledge as to the action of certain drugs on the ureter. As a result of his original investigations he reaches the following conclusions:

1. Pilocarpine, physostigmine, muscarine, pseudo muscarine, and choline, in suitable doses all stimulate the rate and force of the ureteral contractions and increase the tonus of the excised ureter. Large doses of pilocarpine may, however, secondarily paralyze that organ.
2. The pressor action of pilocarpine, physostigmine, and muscarine, is not inhibited by previous exhibition of ergotoxin.
3. Atropine in sufficient (rather large) doses inhibits the contractions and decreases the tonicity of the ureter. Small doses of atropine may produce, though not invariably, a primary stimulation of the ureteral contractions.
4. The same effects as in the ureteral preparations described by the author were noted in rabbits by observing the ureters *in situ*, after administration of pilocarpine, physostigmine, and atropine.
5. The behavior of the ureter toward the drugs studied gives pharmacological proof of its innervation by the sacral autonomics, and is also of some practical interest.

H. W. E. WALTHER.

**Simon, A. R., and Mertz, H. O.: The Supernumerary Ureter; Report of a Case of Complete Unilateral Duplication.** *J. Am. M. Ass.*, 1916, lxxvi, 1686.

The author reports a case of supernumerary ureter on the right side. The three ureteral orifices in the bladder were seen by means of the cystoscope, the extra one—a large round opening with no sphincter-like action—being low down in the substance of the trigone. Pyelograms showed that the right kidney had two separate pelves, and roentgenograms revealed the exact relative position of the two ureters on that side. These two crossed just before they entered the bladder.

Complete bilateral duplication of the ureters is rare, but supernumerary ureters on one side only are more frequent. The most common anomaly is

double pelvis and ureter, with the ureters uniting before they enter the bladder.

The surgical interest in a supernumerary ureter is governed by the location of its meatus. If the opening is extravascular, surgical intervention provides the only correction. If it is of normal size and has a sphincteric action, the condition may remain latent through life. However, if the meatus is in the trigone, so that the folds of mucous membrane may close the opening, hydronephrosis is apt to result.

A supernumerary ureter with an extravascular opening is suggested by a history of constant incontinence, associated with periods of normal urination. However, this symptom does not obtain if the opening is intravesical. The anomaly can be recognized by cystoscopy unless the meatus is among the folds of the trigone or vesical neck, when chromo-ureteroscopy may be necessary. The combined use of the cystoscope and the X-ray is necessary in those cases where the two ureters are joined or have a common bladder opening. With the additional aid of the functional and bacteriologic tests, and the separate collection of urine through the catheter, every case of ureteral anomaly may be recognized clinically.

W. E. LOWER.

#### BLADDER, URETHRA, AND PENIS

**Walther, H. W. E.: Chronic Trigonitis.** *Med. Rec.*, 1916, lxxix, 853.

In local treatment for chronic trigonitis, it seems to be conceded by most writers that irrigations do little if any good. A warm irrigation, combining in solution 1:10,000 silver nitrate with 1:8,000 potassium permanganate may be used. With 1 per cent boric acid solutions distention of the bladder can be practised, using hydrostatic pressure. Cary uses a Dickinson two-way catheter for this irrigation. It is with the instillations and topical applications of silver nitrate, however, that results have been most gratifying.

By first producing anæsthesia locally in the bladder with alypin, novocaine, or eucaine, instillations of 30 to 60 minims of silver nitrate in strengths of from 0.25 to 2 per cent can be employed twice weekly. Through the Kelly cystoscope applications can be made directly to the trigone by using a 5 per cent silver solution on a cotton swab. The pure lunar caustic stick is also used in this way. Cysts on the trigone should be punctured. Diffuse hypertrophy of the papillæ in this area, when tending toward chronicity, should be curetted. These two last-mentioned procedures can be performed through an operative cystoscope in the male and through a Kelly tube in the female.

It may be found necessary, as a last resort, to do suprapubic cystotomy, thoroughly remove the pathologic process on the trigone by curettage, or otherwise apply the necessary treatment through the surgical incision and then drain the bladder, through the suprapubic wound.

H. A. MOORE.

# SURGERY OF THE EYE AND EAR

## EYE

**Arganaraz, R.: Contribution to the Study of Intra-ocular Cancer—Sarcoma of the Choroid** (Contribucion al estudio del cancer intra-ocular-sarcoma coroides). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 175..

In the ophthalmological service of the National Hospital of the Argentine Republic, out of 84,000 patients observed, 30 cases of uveal sarcoma were found, a percentage of 0.03 per cent. The statistical table given by Pawel gives for the various large ophthalmological clinics of the world percentages for choroid sarcoma varying from 0.03 to 0.12 per cent. It occurs as a general rule more frequently in men than in women and in the ages between 45 and 65.

Of the 30 cases referred to by the author, 3 were in the ciliary body and 22 in the choroid. In 5 cases exact location was not possible on account of the condition. The statistics of Sattler's clinic at Leipzig shows 82 per cent as choroid tumors and 8 per cent as ciliary body tumors.

With regard to the treatment it is essentially surgical, either extirpation of the tumor with preservation of the ocular globe; enucleation; or exenteration.

Extirpation with preservation of the globe is usually accomplished by iridectomy. The procedure is usually unsatisfactory as in most such interventions recurrence occurs. Enucleation is the method of election in all cases of neoplasms of the uveal tract to place the patient beyond the chance of recurrence, and intervention should be as early as possible.

When neoplastic nodules show in the superficies of the ocular globe, enucleation ought not to be considered as absolutely indicated, and in such cases it will be prudent to proceed with exenteration of the orbit. Metastases in the internal organs contra-indicate any operative intervention.

W. A. BRENNAN.

**Jocqs and Duclos: Ocular Tuberculosis Secondary to an Industrial Accident; Clinical and Anatomic Study** (Tuberculose oculaire secondaire a un accident de travail; etude clinique et anatomique). *Clin. ophth.*, Par., 1916, vii, 137.

The case reported occurred in a boy of 15, who in November, 1912, was struck in the right eye by a piece of iron. The resulting ulceration was treated with iodine and the boy recovered, but a pronounced perikeratic injection and an intense photophobia persisted. By December whitish spots appeared in the cornea; the cornea was transparent, except where these spots occurred; later on yellowish

granulations covered the whole surface of the iris. The eye became hypotonus without any evidences of pain.

The clinical evidence, aspect of the lesions, and complete absence of pain, suggested tuberculosis and the subsequent histological examination confirmed it. The author thinks that there are two theories to account for the pathogenesis: direct inoculation through the wound, or localization in the organ of a tuberculosis already existing in the organism. It is very difficult to choose between the two in this case.

The eye was enucleated. Histological examinations were made from different sections and these are given in detail. The authors found from these examinations that small tubercular follicles existed in the cornea; that there was a passage of granulation tissue toward the ciliary body and the base of the iris; that following the general rule lesions of tuberculous iridocyclitis remained in the territory of the anterior arterial circuit; that the structure had the same aspect as described by other authors, i.e., in the anterior zone of iris there were epithelial tubercles with lymphocyte aureole; in the posterior parts was a diffuse granulous composition of parenchymatous tubercles.

W. A. BRENNAN.

**Huguenin, M.: Traumatic Rupture of the Ciliary Arteries** (Rupture traumatique des artères ciliaires). *Clin. ophth.*, Par., 1916, vii, 78.

Siegrist, in 1895, described the first case of traumatic rupture of the ciliary arteries and the fundus alterations which were consecutive. These cases are very rare. Besides Siegrist's 4 published cases, the author has found only 5 more in the literature. He now adds 2 more: one personal case, and one from Siegrist's practice. A summary is given of these 11 cases, also a bibliography. The treatment adopted generally in these cases, either subconjunctival injections or cauterization of the sclerotic, does not usually effect very great improvement in the trouble with vision which persists.

W. A. BRENNAN.

**Fernandez, J.: Digital Compression of the Lachrymal Sac in Dacryocystitis of the Newborn Especially** (La compression digital del saco lagrimal en la dacriocistitis del recién nacido especialmente). *Rev. de med. y cir.*, 1916, xxi, 141.

The author dwells on the value of massage of the sac in congenital dacryocystitis, applied continuously and by digital pressure, this being the simplest method of procedure.

Fully as satisfactory results were obtained in the newborn as in the adult. The compression



of the lacrymal sac requires manual dexterity, especially in cases of inflammations or œdemas in the proximity of the sac. In mono-ocular affections, it is best to search for the crest of the lacrymal bone and press upon it immediately, whereupon the lacrymal sac will move from that place in the fossa.

To determine the permeability of the nasal canal, the author instills a drop of fluorescein solution. He believes in Berard's teaching that, "by compression of the sac and antiseptic injections in those lacrymal parts previously dilated, one can properly treat and cure a case of dacryocystitis." As to catheterization of the nasal canal, the author considers it improper treatment; he quotes Hippel's statement that "the sounding of the nasal canal is not easy or inoffensive," and the inexperienced will make false moves which will give rise to new cicatrices.

The author describes the case of a babe, 55 days old, in whom he noticed on the fifteenth day of life a dacryocystitis and an encephaloid tumor, both of which responded equally well to compression practiced continually for several months, when the two conditions disappeared entirely.

He considers it unnecessary to recall that in the diagnosis of a dacryocystitis in general, the first thing to do is to ascertain whether the nasal canal is more or less free, so that when the dacryocystitis is relieved the tears will follow their normal course.

Another case is described of a woman suffering for two years with a subacute dacryocystitis in which compression and lavage of the sac brought about a complete cure. A year after, however, the patient having discontinued washing the sac from time to time, had another inflammation of the sac. Besides the employment of compression, the inferior lacrymal point was dilated to facilitate the egress of all accumulations in the sac.

The author considers digital compression very valuable as the initial treatment in general dacryocystitis. When the condition is so acute and painful as to prohibit its use, he advises applications of ice and abstention from making any incisions, to avoid cicatrices upon the skin of the eyelids.

RAOUL L. VIOBAN.

**Posey, W. C.: Tenotomy of the Inferior Oblique Muscle.** *Arch. Ophthalm.*, 1916, xlv, 137.

Duane is quoted as giving as indications for the operation any deviation due either to actual over-

action (spasm) of the inferior oblique muscle, whether primary or secondary, or a condition in which, with no actual involvement of the inferior oblique, the diplopia and symptoms are such as would be produced by spasm of that muscle.

The condition usually simulating spasm of the inferior oblique is paralysis of the superior rectus, and three conditions are given as causing true spasm or overaction of the inferior oblique secondary to paralysis of other muscles: (1) paralysis of the superior rectus when fixing with the same eye causes secondary spasm in the inferior oblique of the fellow eye; (2) paralysis of the superior oblique or some other depressor or elevator with secondary spasm of the inferior oblique in the same eye; (3) paralysis of the abducens with compensatory spasm of the inferior oblique in the same eye.

Primary spasm of the inferior oblique is regarded as very rare.

The author has operated upon 17 cases with results that were more or less satisfactory in all.

The operation consists in a curvilinear incision just superior and parallel to the lower inner bony rim of the orbit, through which muscle tendon is located with the strabismus hook, drawn forward, and divided with Stevens' scissors.

It is recommended, in children who have squinted from birth, that operation be postponed much longer than the prescribed ten years, as it has been found that in some cases the growth of the orbits and careful correction of the refractive error render the muscular deviation negligible and operation is avoided.

S. S. HOWE.

## EAR

**Good, R. H.: Acute Otitis Media.** *Illinois M. J.*, 1916, xxix, 373.

A brief review is given of the etiology, symptoms, differential diagnosis and treatment, prophylactic, local, and general, of acute otitis media with the object of urging the general practitioner to make an early diagnosis and avoid unfortunate complications.

The author insists upon the necessity of early diagnosis before the drum membrane ruptures and serious pathological changes have taken place in the tympanum. He advises early incision of the drum membrane by an otologist under aseptic conditions and early operation in cases where mastoid symptoms supervene, together with proper general medical treatment.

ELLEN J. PATTERSON.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Lanier, L. H.:** Importance of Treating Diseases of the Accessory Sinuses of the Nose. *J. Arkansas M. Soc.*, 1916, xii, 278.

In acute rhinitis and ethmoiditis, the author has had favorable results with the following medication. The nasal cavities are first irrigated freely with a mild alkaline antiseptic solution. Then the congested and swollen membranes are treated with a 4 per cent cocaine solution, applied by means of a cotton wound probe. This is followed after a few minutes by the application of a 2 per cent antipyrin solution to prolong the local anæmia produced by the cocaine. Benzoinol vapor is then applied. Bishop's coryza tablets and an acetanilide composition are prescribed, to be taken alternately as indicated. An ointment of bismuth and adrenalin is also given, to be applied to the nasal cavities three times daily.

Where the above is not sufficient, an intranasal operation consisting in removal of the anterior end of the middle turbinate and curetting the ethmoidal labyrinth is employed. After the operation is completed, the cavity is packed with a half-inch strip of sterilized gauze, saturated with sterilized benzoated vaseline. After twenty-four hours the packing is removed and the cavity gently irrigated with a warm wine-colored solution of potassium permanganate. It is then loosely packed with a half-inch strip of gauze saturated with a 10 per cent aqueous solution of ichthyol. After twenty minutes this is removed. This treatment is given once or twice daily for the first three days, after which a mild alkaline antiseptic solution is used by the patient two or three times daily. Benzoinol vapor is to be used after each irrigation. In frontal sinusitis the middle turbinate may be either infracted or resected, after which a sound is passed, followed by irrigation.

If more operative work is indicated, the uncinate process is resected and the anterior ethmoid cells curetted. If this fails, the external operation is indicated, the indications of which are thus tabulated:

1. When other forms of operation have failed.
2. The appearance of a fistula, abscesses, or necrosis.
3. When symptoms of intracranial complications appear.
4. When, during the course of a chronic frontal sinusitis, pain and fever suddenly appear and the discharge becomes fœtid.
5. When the headache referred to the eye is not influenced by intranasal procedures.

6. When the discharge remains fœtid despite frequent irrigations.

7. When the sinus inflammation gives rise to recurrent polypoid hypertrophies and polyp formations.

8. When a simple purulent discharge is not relieved by intranasal measures and the patient is anxious to procure permanent relief from his annoying symptoms.

OTTO M. ROTT.

**Quinlan, F. J.:** Significance of Hæmorrhage in Operations on the Nose and Throat. *Med. Rec.*, 1916, lxxxix, 677.

In discussing the etiological factors of hæmorrhages in operations upon the nose and throat, the author divides them into local and constitutional.

The chief local factors, mentioned in the order of importance, are:

1. Incomplete removal of tissue due to faulty technique.

2. Local lesions of blood-vessels, particularly when the vessels are anomalously placed or when adjacent tissues are injured.

3. Local tissue anomalies such as inflammatory processes or areas of congestion. Anæsthetics contribute to this condition, general anæsthetics at the time of operation and local anæsthetics secondary to the operation.

The constitutional causes are hæmophilia, purpura hæmorrhagica, leucæmia, anæmia, and exophthalmic goiter.

The local measures mentioned for the control of post-operative nasal hæmorrhage are:

1. Pinching the alæ close together and bending the head forward in order to hold the clot in position until organized.

2. Local injections of 20 to 30 ccm. of warm liquid gelatin.

3. Yankauer's method of stitching the posterior tip of the turbinal.

4. Anterior packing.

5. Post-nasal tamponade with anterior packing.

Local measures for the control of post-operative tonsillar hæmorrhage are:

1. Absolute rest of mouth, throat, and body.

2. Digital compression by means of gauze wrapped around the finger and dipped in peroxide or antipyrine.

3. Tonsil hæmostat.

4. Bringing the tonsil pillars together by means of large metal clamps after a gauze tampon has been inserted into the fossa.

5. Suturing the pillars.

6. Constriction of the bleeding stump.

7. Ligation of the common carotid.



Other procedures are the application of precipitated blood sera in the form of serum powder, whether the bleeding be from the turbinates or the tonsil fossæ. Coagulin is also used.

The constitutional hæmostatic measures are:

1. Injection of serum 20 to 40 ccm. If bleeding continues, the dose — 10 to 30 ccm. subcutaneously or 10 to 15 ccm. intravenously — may be repeated at intervals of 2 to 6 hours or longer.
2. Injection of pituitrin 1 ccm.
3. Calcium lactate internally. OTTO M. ROTT.

### THROAT

**Lack, H. L.: Partial Excision of the Thyroid Cartilage as an Alternative to Thyrotomy in Malignant Disease of the Vocal Cord.** *Proc. Roy. Soc. Med.*, 1916, ix, *Laryngol. Sect.*, 62.

The larynx and trachea were exposed through the usual median incision and a Hahn cannula inserted. The right ala of the thyroid cartilage was exposed and the perichondrium detached from its lower half. The thyroid cartilage was divided in the median line, as in thyrotomy, and then the shears were turned at right angles so as to split the right ala horizontally about its center. The soft parts of the larynx were carefully divided in the median line in front, and then the incision was carried backward through the ventricle of the larynx. This aperture being held open with retractors gave a good view of the growth and it was extended through the crico-thyroid membrane and the mucous membrane of the larynx well below the growth. The quadrilateral flap, consisting of the lower half of the right ala of the thyroid with the vocal cord attached, was not bent firmly outward. This gives a much better view than is presented by thyrotomy and allows greater facilities for removing the posterior part of the cord, and for arresting troublesome bleeding.

The advantages mentioned are: (1) Better access means an easier, more rapid, and more thorough operation. (2) The removal of the underlying cartilage certainly aids in thoroughness. (3) The easy control of bleeding means less trouble with the anæsthetic and less danger of blood entering the lungs. (4) Should packing of the wound be considered necessary, it is much easier to introduce it and later to remove it. It eliminates the necessity of splitting the thyrohyoid membrane and the violent pulling apart of the two halves of the thyroid which often leads to much subsequent discomfort and difficulty in swallowing. OTTO M. ROTT.

### MOUTH

**Eisen, E. J., and Ivy, R. H.: Roentgenologic Examination in Elimination of the Mouth as a Source of Infection in Systemic Disease.** *Am. J. Roentgenol.*, 1916, iii, 269.

For the purpose of excluding infection in the mouth as a causative factor in arthritis, neuritis, etc.,

the author uses a very excellent routine consisting of (1) inspection, (2) response of each tooth to faradism, (3) roentgen examination, and (4) microscopic examination if pus is present.

By inspection he determines the presence of pyorrhœa, ulcerations, sinuses, swellings, or other abnormalities.

The electric examination determines the vitality of each tooth.

In making the roentgen examination he makes a plate of each side which shows the molars, cuspids, and bicuspid, in both upper and lower jaw. Small films are then made of any suspected areas, which includes all devitalized, crowned, or missing teeth.

The position used for making all the teeth on one side of the face on one plate is a very good one. The side of the face is laid against the plate, the tube being placed behind and toward the feet. The direction of the straight ray is therefore upward and forward, and enters the body beneath the angle of the opposite jaw.

The resultant picture shows the teeth of the desired side as a plane surface, with little foreshortening or magnification, and with none of the teeth on the opposite side superimposed.

In reporting his roentgenologic findings the author does not feel justified in making a definite diagnosis, but reports the condition present as normal, probably normal, probably diseased, or definitely diseased. The report embodies the results of the electric as well as the roentgen examination.

If the patient has been referred by a physician, a written report is submitted, the plates and films being retained by the roentgenologist as a record of his examination. These records are open to the inspection of the physician or any one properly authorized by him to make such inspection. They are never given to the patient to be passed upon by a third party. If the patient is referred by a dentist the plates and films are sent to him, without report, for his own interpretation. G. W. GRIER.

**Darling, B. C.: Oral Sepsis as a Focus of Infection.** *Am. J. Roentgenol.*, 1916, iii, 158.

This paper is made up largely of extracts from articles by Rosenow, Hartzell, Rush, Price, Broomell, Chayes, Ottolengui, and others to prove first, that oral sepsis may serve as a focus for infection leading to systemic diseases of various kinds, and, secondly, that poor dentistry is largely responsible for oral sepsis. In proof of the latter contention the author offers numerous examples in the form of specimens and roentgenograms illustrating mechanically defective crown and bridge-work, imperfect root-canal fillings, and other faulty dental operations. He maintains that the roentgenogram is practically infallible in the diagnosis of oral conditions and that the information thus obtained is an important factor in determining the proper procedures to correct the given condition.

A. HARTUNG.

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# INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1916

## COLLECTIVE REVIEW

### THE SURGERY OF GLAUCOMA

By EMORY HILL, A.B., M.D., CHICAGO  
Associate in Ophthalmology, Rush Medical College

SOME historic perspective is essential to an understanding of the present enthusiasm of ophthalmic surgeons in regard to glaucoma and the voluminous literature of the subject. No ophthalmic topic is more important and perplexing, and none lends itself more readily to argument. Wide diversity of opinion must exist so long as several different types of eye disease are included under one name, the etiology of certain types unknown, and many surgical procedures effective in selected cases and ineffective in others. Indeed, some phases of the glaucoma problem seem as far from solution today as in the remote past.

The word glaucoma (*glaukos*, sea-green) dates back to antiquity. It describes the discolored and dilated pupil in eyes with abnormally high tension, and in certain other eyes as well. The term was applied to a number of conditions and not until 1656 was cataract differentiated from glaucoma as an opacity of the crystalline lens. Increased intra-ocular tension was recognized by Platner in 1745, but its significance was not understood until Mackenzie in 1830 established the invariable association of undue hardness of the eyeball with the clinical signs of the inflammatory type of glaucoma. Before the invention of the ophthalmoscope (1851) the inflammatory type alone was recognized. The study of the eye-grounds made possible by this instrument quickly resulted in the recognition of a non-inflammatory type of glaucoma in which the effects of hypertension are slowly produced and sufficient ad-

justment made to this increase of tension to obviate an inflammatory reaction. In 1853 Jacobson observed the optic disc in glaucoma and mistook the depression for an elevation. Von Graefe (1) in the following year fell into the same error but quickly discovered the mistake and described the glaucomatous cupping. The relationship of this condition to increased intra-ocular tension, however, was not clear to him and he called the condition "amaurosis with excavation of the nerve-head." Heinrich Mueller confirmed these findings anatomically. The observation that excision of a piece of the iris in cases of staphyloma of the cornea is followed by a lowering of tension led von Graefe to practice this operation in glaucoma (1856). The use of iridectomy for the relief of glaucoma was an epoch-making event in surgery, and with it the name of von Graefe is associated as one of the benefactors of mankind. Previous to this time inflammatory glaucoma inevitably meant blindness, but since the advent of von Graefe's discovery the majority of such cases are relieved.

Subsequent studies of glaucomatous eyes with reference to the anatomy of the anterior half of the globe furnished a partial explanation of the restoration of normal tension after iridectomy. Leber described the obliteration of the angle of the anterior chamber and Weber and Knies (1876) confirmed these findings anatomically. In 1879 Priestly Smith (2) published measurements of the crystalline lens at various periods of life showing the progressive growth of the lens,

especially after the fourth decade producing a disproportion between the lens and the total size of the eye as compared with the proportion in earlier life. In brief, the glaucomatous state is brought about by a crowding forward of the iris against the posterior surface of the cornea at its periphery, with a consequent blocking of the exit of the aqueous fluid from the anterior chamber into the canal of Schlemm at the sclerocorneal margin. The hypertrophy of the overfunctioning ciliary muscle in the hypermetropic eye favors the blocking of the iris angle; thus hypermetropia is a predisposing factor in glaucoma. Obviously an inflammatory exudate from the uveal tract produces an excess of intra-ocular contents and such exudate may clog the channels of exit.

Thomson Henderson (3) has advanced a theory of glaucoma within the past decade which has aroused much interest. He believes that the pectinate ligament at the angle of the anterior chamber is a cellular structure in early life and becomes progressively sclerosed with advancing age as a result of the influence of the constantly contracting ciliary muscle, to which he believes this ligament serves as a base of attachment. This sclerosis cuts off the exit of the aqueous and places the responsibility of ocular drainage upon the iris veins which may be inadequate to this excessive demand. In the absence of other causes — vascular, nervous, or biochemical — no increase of tension will occur, but the sclerosed structure at the iris angle furnishes an anatomical basis for hypertension, according to Henderson, when precipitating causes arise. There is frequently a connection between glaucoma and high blood-pressure, but the extent to which general arterial hypertension is responsible for ocular hypertension is still in dispute. Intra-ocular hæmorrhage may, of course, precipitate a glaucomatous attack.

There is no unanimity of opinion as to these various theories, and we must be content at the present time to say that an imbalance between the formation and excretion of intra-ocular fluids, normal or abnormal, gives rise to hypertension of the globe. Variations in intra-ocular tension are quickly compensated for by variations in outflow under normal conditions. Numerous factors may impede drainage and cause hypertension. In the words of Priestley Smith, glaucoma signifies "an excess of pressure within the eye, plus the causes and consequences of that excess." It is not a disease entity but a term applied to a symptom-complex which may be the manifestation of a variety of diseased conditions. Indeed, the symptom-complex varies within wide limits,

from the violent inflammatory glaucoma to the simple chronic form of insidious character which some observers would not class as properly the same disease. Moreover, glaucoma may be the direct result of a pre-existing or coincident inflammatory process or trauma of the eye (secondary glaucoma) or may be independent of any other demonstrable disorder of the eye (primary glaucoma). A distinct type of the symptom-complex is congenital or infantile glaucoma (hydrophthalmos or buphthalmos) in which the eye is greatly enlarged by stretching of its tunics in intra-uterine life or in infancy.

With many kinds of eye disease, varying in cause and clinical course, classed together under one name because of one common symptom, increased hardness of the eyeball, and with simple glaucoma remaining one of the mysteries of medical science, it is natural that many kinds of treatment have been tried and none found successful in all cases. The fact that glaucoma is a manifestation not merely of a diseased eye but of a diseased body as well is being emphasized, and a more comprehensive study of these cases is being made than in former years. While awaiting the establishment of a definite etiology and an effective prophylaxis it is the difficult task of the ophthalmic surgeon to seek to obtain permanent drainage of the ocular fluids and avoid certain dangers incident to the maintenance of the drainage. The reports of efforts to accomplish this task fill the pages of ophthalmic literature of recent years.

The surgery of glaucoma is discussed at length in the many textbooks of ophthalmology and with especial fullness in the American Encyclopedia of Ophthalmology (4) in which the following convenient classification is made: (1) operations on the posterior half of the globe; (2) operations on the anterior half of the globe; and (3) operations on the sympathetic system of nerves. A brief consideration of the older operations under these three headings will serve as a background to a more critical study of the recent extensive literature dealing with newer operations.

1. *Operations on the posterior half of the globe* consist in puncturing the tunics of the eye (sclera, chorioid, and retina) for the purpose of allowing the escape of some of the vitreous humor. This procedure affords a rapid decrease in intra-ocular tension by lessening the intra-ocular contents but is transient in effect as the wound quickly heals. Guérin of Lyons is credited with this operation of posterior sclerotomy as far back as 1769. As now performed, the operation



usually requires only local anæsthesia (cocaine), after which the conjunctiva is grasped with forceps near the sclerocorneal limbus and the globe rotated so as to allow the entrance of a Graefe cataract knife as far back as possible into the vitreous chamber. A quick puncture of the tunics, passing the knife several millimeters in, and a slow withdrawal, give the minimal result, namely, the escape of a small bead of vitreous. A somewhat greater immediate effect and also a more prolonged effect is obtained by an L-shaped incision, in which the knife, after the puncture, is rotated on its long axis  $90^{\circ}$  and withdrawn so that two linear cuts in the form of a letter L are produced. This wound allows more gaping and heals more slowly than the simpler incision first described.

2. The simplest of the many *operations on the anterior half of the globe* aims to accomplish the same result. Paracentesis of the cornea is performed by incising this membrane just within the sclerocorneal limbus with a small keratome or a Desmarres needle which is a small lance with a thickening at its base to prevent the needle's entering beyond the desired distance. Slow withdrawal of the instrument with gentle pressure against the posterior lip of the wound allows the anterior chamber to empty. Local anæsthesia is often sufficient for this as for the preceding operation, but very high tension with engorgement of the ocular circulation diminishes the effect of local anæsthetics and, therefore, safety sometimes demands the use of general anæsthesia. Miotic drugs, as eserine, are practically always used both before and after these operations. The corneal wound can be opened by gentle manipulation with a small spoon or spatula and the effect of the operation renewed for several successive days in this way.

Such transient lowering of tension is of service in the presence of a presumably transient hypertension where permanent relief may be expected in a few hours or days, as in the secondary glaucoma occurring in the course of an iridocyclitis or traumatic cataract when the filtration angle is blocked by uveal exudate or lens matter or blood. In acute inflammatory glaucoma with a very shallow anterior chamber posterior sclerotomy reduces tension and deepens the anterior chamber sufficiently to allow iridectomy to be performed with safety. It also serves to relieve pain in absolute glaucoma, and to reduce tension temporarily in both acute and chronic secondary glaucoma.

*Iridectomy.* The very brief duration of the beneficial result of these simple puncture operations limits their usefulness. The procedures

promising a more prolonged effect constitute the bulk of the operations performed upon the anterior half of the globe. Of these, the classic iridectomy of von Graefe (1856) has been mentioned. The detailed description of the operation is available in the textbooks and need not be repeated here. It is necessary, however, to consider some features of this operation at length in order to understand the present-day problems of glaucoma surgery. Iridectomy is so important an operation that every other method of reducing intra-ocular tension has to bear rigid comparison with this time-honored procedure. It is also noteworthy that the excision of a piece of the iris is one step in many other operations; whether an essential or a negligible step is a question which concerns us greatly.

The use of miotics and, in the presence of an acute glaucomatous attack, a preliminary posterior sclerotomy increase the safety of iridectomy. Local anæsthesia suffices in non-inflammatory cases, but general anæsthesia is necessary in the inflammatory type where tension is very high and but little effect is secured from cocaine. A wide keratome is preferred by most operators except when a very shallow anterior chamber makes it difficult to pass a keratome between the cornea and lens without injuring one or the other. In this case a narrow Graefe cataract knife is used. The incision is regulated so as to open the angle of the anterior chamber which is posterior to the visible sclerocorneal limbus. Unless this is accomplished the iris cannot be cut or torn at its ciliary attachment or root and the purpose of the operation is defeated. Therefore the incision and the iridectomy are essentially different from the procedures used when iridectomy is performed for optical purposes and as a preliminary step in the extraction of cataract. Bearing in mind this important difference, the surgeon begins his keratome incision 2 mm. back of the upper limbus, piercing the sclera with the blade nearly perpendicular, then depressing the handle as soon as the tip of the keratome is seen in the anterior chamber, and pushing the blade forward between the cornea and iris in the plane of the latter until the incision is 9 or 10 mm. in length. The keratome is then cautiously withdrawn, allowing the aqueous to flow out slowly. The incision may be lengthened by pressing the edge of the keratome against one angle of the wound while withdrawing, but it is desirable to make the entire incision while the keratome is advancing through the anterior chamber unless the shallowness of the chamber makes sufficient advance of the instrument dangerous to lens and



cornea. The withdrawal of the keratome requires great care and precision to avoid a sudden gush of the aqueous and consequent prolapse of lens and vitreous with intra-ocular hæmorrhage.

In dealing with an extremely shallow anterior chamber the Graefe knife may be used as in the operation for extraction of cataract except that the puncture is made 1.5 mm. beyond the visible sclerocorneal limbus at one side, about 3 mm. above the horizontal diameter of the cornea, and the counter puncture at a corresponding position on the opposite side, and the knife emerges 2 mm. behind the upper limbus. Perhaps no more exact and difficult technique is required in the entire domain of surgery than is demanded of one who executes correctly an iridectomy for glaucoma, and the difficulties and dangers of such operations, with the issues at stake, are ample warrant for the large amount of space devoted to the subject in surgical literature. After the incision is completed it is well, if local anæsthesia has been used, to place a sterile eye-dropper against the posterior lip of the wound and, making gentle pressure to open the wound slightly, place a drop of cocaine directly on the iris to insure more complete anæsthesia. Iris forceps are now passed with closed blades into the anterior chamber and opened to grasp the iris near the pupillary border. Slowly withdrawing the forceps, the iris is drawn through the wound. With the prolapsed iris drawn taut a snip is made with iris scissors through the portion of the iris next to one angle of the wound; further pulling toward the opposite angle of the wound tears the iris from its ciliary attachment and a final cut with the scissors results in severing about one-fifth of the iris from its attachment, thus opening the angle of the anterior chamber. Unless the iridectomy is wide and extends back to the root of the iris the purpose of the operation is not accomplished. This fact has not been sufficiently appreciated and no doubt the failures to relieve glaucoma by iridectomy are in many instances to be attributed to improper performance of the iridectomy.

It is difficult to formulate any generally acceptable theory as to the way in which iridectomy effects a cure of glaucoma or the limitations to be set to the use of this operation. That the excision of iris back to its root removes the obstruction to the exit of intra-ocular fluid through the spaces of Fontana at the iris angle is perhaps the most widely accepted explanation. That the cut edges of the iris do not adhere but remain as a raw surface allowing drainage of the aqueous into the iris veins is an observation which bears upon

this question. It has been maintained that the iridectomy is an unimportant feature of the operation and that the effect is in reality attributable to the scleral incision. It should be emphasized that iridectomy aims to reopen the natural channel of drainage in contrast to some of the more recent operations which attempt to produce new channels. The most positive statement which one can make about iridectomy is that it has a pre-eminent place in the relief of acute inflammatory glaucoma. Whether the newer operations will replace iridectomy in this class of cases remains to be seen; but for the present no other method of restoring the balance of intra-ocular circulation shows equal results. The earlier the operation the more successful the result. When obstruction of the iris angle is due to vascular congestion and not to permanent adhesion of iris to cornea, as in the chronic type of glaucoma, iridectomy removes the obstruction. In subacute glaucoma the effects are somewhat less sure. In the chronic form (simple glaucoma) the results are not sufficiently uniform to give satisfaction. The status of iridectomy in acute glaucoma is indicated by the tabulation of Wygodski (5), showing a favorable outcome in 80 per cent of all cases. In glaucoma simplex statistical reports lack uniformity. Hallauer (6) found tension reduced to normal in 80.5 per cent of cases, with recurrences in 31 per cent. Von Hippel (7) believes that iridectomy is urgently called for as the surest means of combating glaucoma. De Wecker (8) found that nine-tenths of a group of 120 ophthalmic surgeons favored iridectomy in glaucoma simplex while the remaining one-tenth considered it comparatively useless. In hæmorrhagic glaucoma and buphthalmos iridectomy is disappointing. A persistent effort has been made to find more effective operative procedures for these less favorable types. These methods concern chiefly the drainage of the aqueous, and therefore belong in the classification of operations upon the anterior half of the globe. They have been conveniently divided into (a) operations which attempt to effect a communication between the anterior chamber and the subconjunctival spaces; (b) operations which attempt to effect a communication between the anterior chamber and the vitreous; and (c) operations which attempt to produce drainage through the chorioid and the suprachoroidal spaces.

a. The operations which attempt to effect a communication between the anterior chamber and the subconjunctival spaces are based upon the



two procedures already discussed, paracentesis of the cornea and iridectomy. Thus, de Wecker practiced anterior sclerotomy (1867) in which substantially the incision with the Graefe knife as used in the iridectomy operation is made, but a bridge of tissue 2 mm. wide is left intact behind the upper limbus to prevent prolapse of the iris. In this way a filtering cicatrix is utilized for securing additional drainage at the angle of the anterior chamber. De Wecker considered this procedure a valuable preliminary step to iridectomy when the anterior chamber is very shallow. He preferred it to other operations, in combination with miotics, in chronic glaucoma and in the other types of the disease in which iridectomy is not highly satisfactory, as hæmorrhagic glaucoma and buphthalmos, and as a means of reducing pain in absolute glaucoma. The operation has not been used extensively in recent years. Various modifications of it were made with the addition of incision into the iris tissue. Panas (9) (1884) practiced iridosclerotomy in which he passed the knife through the iris from before backward traversing the posterior chamber and again piercing the iris before making the counterpuncture. Knies (10) (1893) used a keratome and attempted to produce an iridodialysis, pulling the iris away from its ciliary attachment. De Wecker accomplished the same result by tearing the iris with forceps passed into the anterior chamber. De Vincentiis (11) (1893) used a sickle-shaped knife with a convex cutting edge, sweeping around the angle of the anterior chamber cutting the tissues to a depth of 1 mm. or more. Obviously these several methods have the common aim of the original iridectomy operation and all endanger the crystalline lens; none of them has become popular.

b. The observation that excess of intra-ocular fluids exists mainly in the vitreous chamber, as evidenced by the bulging forward of the iris from pressure behind it, has led to attempts to effect a communication between the anterior chamber and the vitreous in order to restore normal depth to the anterior chamber and open the iris angle. Thus Chibret (12) (1898) practiced sclero-cyclo-iridic puncture, using a double-edged Graefe knife, entering 3 or 4 mm. behind the limbus and passing obliquely through the sclera into the angle of the anterior chamber. The iris was pushed forward by the knife and its ciliary attachment loosened. This procedure was repeated in 5 or 6 meridians. Severe hæmorrhage into the anterior chamber is a disadvantage in such an operation. Sclerotomy antero-

posterior has been done after unsuccessful iridectomy. A Graefe knife is introduced into the anterior chamber and passed backward through the coloboma into the vitreous. This is practically limited to use in blind eyes where injury to the crystalline lens is negligible. Hern (13) (1899) practiced corneo-irido-vitreous puncture after iridectomy. A very small Graefe knife is passed through the coloboma to the circumferential space and lateral movements made to widen the cut. All these methods are so dangerous as to be practically limited to eyes in which vision is already lost. They, like the preceding group, have not become popular.

c. The attempts to produce drainage through the chorioid and the suprachorioid spaces have differed somewhat from the previous group. Here the effort has been to sever the attachment of the ciliary muscle to the sclera. Hancock (14) used a Beer's knife entering at the sclero-corneal limbus below and temporally and incising the sclera obliquely backward for more than one-eighth inch. Walker used a narrow knife, entering the cornea just within the limbus with the cutting edge directed away from the anterior chamber. Thrusting through the base of the iris, he withdrew by cutting out through the sclera. Querenghi (15) (1900) attempted, by means of a scleral incision with a narrow knife, to enter the posterior chamber and to incise the chorioid by sawing movements from within outward. These operations are dangerous and deserve mention only as predecessors of the more important recent measures.

In addition to these many operations upon the eyeball brief mention must be made of (3) *operations upon the sympathetic system of nerves*. The operation of excision of the superior cervical ganglion was based on the observation that section of the sympathetic results in a soft eye, which seems to have been known as long ago as the early years of the eighteenth century. The effect of cutting the ganglion is greater than that of cutting the cord, but both are temporary. The influence is probably vascular and muscular through Mueller's muscle at the apex of the orbit. Jonnesco (16) (1899) removed the superior cervical ganglion by means of an incision parallel to the anterior border of the sternomastoid muscle opposite the angle of the jaw, dissecting between the carotid artery and vein until the ganglion is exposed behind the artery. The ganglion is freed from its surroundings and cut with scissors; the ascending and descending cords are cut likewise. Though favorable results have been re-



ported, the effects are not permanent and several deaths have followed. Excision of the ciliary ganglion has also been attempted. Rohmer (17) made a Kroenlein resection of the outer wall of the orbit, divided the external rectus muscle, and passed forceps along the side of the optic nerve attempting to grasp and crush the ganglion. The operation is difficult, the actual destruction of the minute ganglion embedded in orbital fat uncertain of accomplishment, and the operation has not found favor in spite of some reported successes. Avulsion of the infratrochlear nerve was attempted in 1883 by Badal (18) to relieve pain in glaucoma; the results were temporary. All of these procedures have fallen into comparative disuse and in the literature in recent years no tendency is shown to attack the glaucoma problem from the direction of the sympathetic nervous system.

One new operation upon the posterior half of the globe deserves mention. In 1913 Wicherkiewicz (19) suggested what he termed *sclerotomy cruciata multiplex* where operations upon the anterior half of the globe had failed in securing permanent result. He exposed the sclera extensively by dissecting back a large flap of conjunctiva and Tenon's capsule and made from four to six parallel meridional incisions with a Graefe knife as far back as possible, each 10 to 12 mm. long, through the sclera, and then as many more incisions at right angles to the first series. The flap was then sewed into place. Immediate massage enhanced the effect. This operation seems to have made no headway in the presence of the many rivals now attracting attention.

Heine's cyclodialysis (20) is of more importance. The one method of securing drainage through the suprachoroidal spaces which has obtained favor is that devised by Heine in 1905. He seems to have received the suggestion from Fuchs' observation that detachment of the choroid sometimes follows cataract extraction and iridectomy and occasions a subnormal tension. Under local anæsthesia a large conjunctival flap is dissected up from the lower temporal quadrant. A 2-mm. cut through the sclera is made 5 mm. back of the limbus and parallel to it. This incision is made carefully with a keratome to avoid injuring the uveal tissue beneath. The black color of the uvea indicates that the sclera has been penetrated. A spatula, slightly curved at the end, is passed gently within the scleral wound and worked forward between the sclera and the ciliary body with its plane parallel to these structures until the tip appears in the anterior chamber. Sweep-

ing the spatula from side to side widens the tunnel beneath the sclera. Hæmorrhage from the anterior ciliary vessels is a complication which interferes with the good results of the operation unless the blood absorbs quickly; injury to the lens must be carefully guarded against. The conjunctival flap is replaced and stitched.

This operation has been advised especially in chronic glaucoma both as the operation of choice and as a last resort after iridectomy has failed, in cases in which iridectomy cannot be performed, and in buphthalmos. Meller (21) has classified the results of cyclodialysis as follows: (1) permanent reduction of tension in about 30 per cent of cases (after the first three days); (2) temporary reduction of tension in about 40 per cent of cases (increase of tension recurring after a few weeks); (3) no effect on tension in about 30 per cent of cases, especially in absolute glaucoma. Wernicke found improvement in 57 per cent of 76 operations, 20 being observed for a period of over two years; temporary improvement in 25 per cent; 9 showed no improvement. Meissner and Sattler reported 54 operations, concluding that cyclodialysis is designed especially for chronic glaucoma but that it exhibits no marked difference in effectiveness from iridectomy. They emphasize the danger of hæmorrhage from the anterior ciliary vessels. Knapp thought after an experience of 18 cases that the operation was not an adequate substitute for iridectomy.

Of chief interest among the innumerable procedures suggested for the relief of glaucoma, in addition to cyclodialysis, are those which have come into vogue in the past decade as a result of dissatisfaction with the older methods of treating the chronic types of glaucoma in which iridectomy is of uncertain value. Gradually the opinion that a soundly healed cicatrix possesses filtration properties has lost favor, and operators have attempted to produce a permanent path of exit for the aqueous through the scleral tissue by creating a cystoid cicatrix. Two special methods of producing this are by the use of a trephine to remove a button from the sclera, and the deliberate incarceration of iris tissue within the scleral wound. Thus the newer operations may conveniently be studied under the three headings of (1) cystoid cicatrix, (2) trephine operations, and (3) incarceration operations.

1. *Cystoid cicatrix.* The first important operation devised to obtain a cystoid cicatrix was the *iridosclerectomy* of Lagrange (22) (1906). After the use of eserine and local anæsthesia a



Graefe knife is used as in the operation of iridectomy, puncture and counterpuncture being made well back of the limbus. The knife is turned backward on completing the incision above and emerges very obliquely behind the upper limbus making a large flap. The sclera contained within this flap is then cut out with fine curved scissors. An iridectomy is made and the conjunctival flap replaced. Lagrange at first advised iridectomy in all cases but later limited its use to cases in which there seemed to be danger of prolapse of the iris if left intact. He holds the operation to be especially adapted to simple chronic glaucoma and has protested against its unlimited use in all varieties of glaucoma. The thickness of sclera removed may be regulated according to the amount of weakening desired in the sclera, the amount of sclera excised being in inverse proportion to the degree of hypertension. A valuable discussion of the merits of the Lagrange operation was made by Ballantyne in 1910 (23). Further consideration of it will be given by comparison with some of the other procedures to be described.

Holth's (26) punch-forceps operation is an important modification of the Lagrange method. In order to lessen the size of the scleral opening and to regulate the excision, Holth made a less extensive incision and, having dissected away the conjunctiva from the underlying sclera of the anterior lip of the wound, he removed a bit of this scleral flap with punch-forceps. The excised sclera measured  $3 \times 1.5$  mm. This operation has been practiced with much success. Butler (24) prefers it to any other on account of ease, safety, and quickness of execution.

In 1907 Herbert (25) described what he termed the wedge-isolation operation which he considered superior to the Lagrange in that the incision is shorter, the iridectomy smaller, and the amount of scleral excision better regulated. This operation has not gained favor, to the surprise of those who have witnessed Herbert's results, probably because of the difficulty of gaining a clear idea of the minute details from a written description even so carefully and fully stated as Herbert's own description. The following brief résumé will indicate the difficulty: An old Graefe knife ground down to a breadth of less than 1 mm. is used. Puncture and counterpuncture are made high up so that the anterior chamber is traversed for only a short distance in its upper portion. The incision is continued upward and backward until the sclera is cut through, but a bridge of conjunctiva is left uncut. The knife is then pushed back into the

scleral wound and turned upward and forward so as to make a second cut through the sclera from behind forward. This serves to isolate a wedge of sclera with the apex toward the anterior chamber. Subsequent shrinkage of this wedge leaves a filtration area. A very small peripheral iridectomy is made without the necessity of cutting the bridge of conjunctiva above. Herbert's first report indicated favorable results in 38 cases.

2. *Trephine operations.* Argyll Robertson (27) used a scleral trephine fifty years ago. Strawbridge of Philadelphia, Howe of Buffalo, and Froehlich also used such an instrument; but the procedure seems to have found no favor until Fergus (28) used it in connection with cyclodialysis. He dissected a conjunctival flap up to the corneal margin and beneath it made a trephine opening through the sclera 1 or 2 mm. back of the limbus. He then passed a spatula through this opening and separated the sclera from the ciliary body and the iris until the spatula appeared in the anterior chamber. Some confusion has arisen between this and the trephine operation of Elliot. The latter is sometimes called the Fergus-Elliot operation. The facts are that Fergus practiced his operation independently of Elliot and before Elliot's first publication (1909) but did not describe it in the literature until a few months later and, of more importance, the two operations differ in such essential features that there is no justification for confusing them. Elliot makes the trephine opening in the corneoscleral junction, entering the anterior chamber and making an iridectomy. Fergus trephines entirely in the sclera and enters the anterior chamber only after tunneling between the sclera and the uveal tissue. The route for the evacuation of aqueous is different in the two cases.

*Elliot's operation* (29) was developed from a large experience in the British medical service in India. He dissects up a large conjunctival flap with the base at the upper sclerocorneal limbus. Reflecting this flap over the cornea and holding it with forceps from below, he steadies the globe and continues the dissection with blunt scissors going between the lamellæ of the cornea so that the trephine can be placed astride the limbus and the buttonhole include corneal as well as scleral tissue. It is essential that the dissection go below the superficial tissues getting well down to the sclera proper in order not to buttonhole the conjunctiva. The trephine hole is 2 or 2.5 mm. in diameter. Various models with handles constructed for the convenience of the operator, and with diameters varying from 1.5 to 3.5 mm., have



been manufactured. Holding the trephine over the limbus, making sure to include the cornea in the incision, the cutting edge is inserted by means of a few twists of the fingers. Further revolving of the instrument effects a passage through the sclera. Experience enables one to be sure that he has entered the sclera without withdrawing to inspect the incision. Firmness in holding the instrument and the use of very little force are necessary. The sensation of resistance to the instrument ceases when the trephine cut is complete, and aqueous wells up around the trephine. Elliot makes slightly more pressure on the corneal side of the incision so as to be sure of going well forward and entering the anterior chamber. Thus a hinge may be left on the scleral side of the incision and hold the button which in this case can be removed by one snip of the scissors. This same snip of the scissors may also be utilized for accomplishing a small peripheral iridectomy if the iris presents in the buttonhole. Elliot did not at first regard the iridectomy as an important feature of his operation; in fact he has never attempted to make the type of iridectomy described in the classical operation, but practically he finds that a small peripheral iridectomy is useful in preventing prolapse and consequent obstruction of the trephine opening. The conjunctival flap must be carefully replaced. Some operators prefer to secure the flap in place by stitches, but it is generally considered sufficient to stroke the flap with a spatula until it is thoroughly spread over its original bed. Eserine is instilled if the iris tends to prolapse; otherwise no drops are used. The anterior chamber remains shallow for a long time and the tension correspondingly low. A bleb of conjunctiva indicates the site of the scleral opening.

Fox (30) has utilized the Van Lint sliding flap, making a quadrilateral flap of conjunctiva with the attached base at one side so that the flap can be drawn over the upper portion of the cornea, covering the trephine opening, and sutured at the opposite side. David Priestley Smith (31) uses a keratome instead of the trephine and makes a triangular incision in the anterior lip of the keratome wound by means of two converging cuts of the scissors, so that the apex of the triangle points toward the center of the cornea. Elliot in several later contributions has defended his operation for practically all varieties of glaucoma. He now makes an iridectomy in all cases and uses atropine to forestall the "quiet iritis" which is likely to occur. He objects to the sliding flap. He does not admit that the technical difficulties

of the operation are beyond the skill of the moderately experienced ophthalmic surgeon.

3. *Incarceration operations.* Curiously, the accident against which ophthalmic surgeons have always guarded, namely the incarceration of iris tissue into the scar of a scleral or corneal wound has been practiced deliberately in recent years. Several observations have led to this. It has been frequently noted that such incarcerations left the tension permanently lowered and that aqueous leaked into the subconjunctival space; that iridectomies for glaucoma in which the operation was technically most imperfect, iris being entangled in the wound, gave very satisfactory results; and that the danger of infection is minimized if the prolapsed iris is covered by conjunctiva. Therefore, several surgeons were bold enough to attempt to incarcerate the iris in a small scleral wound. Herbert (32) has discussed the subject fully in the English literature and has described several procedures in which he has incarcerated iris and also conjunctiva in the scleral incision. Holth (33) has practiced with much success his operation called *iridencleisis*. He makes a very oblique keratome incision beginning far back of the upper limbus so as to have a broad layer of conjunctiva. After a small peripheral iridectomy he draws a fold of iris into the wound and leaves it covered with conjunctiva. The anterior chamber remains empty for a long time. Various modifications of this method have been made. Most of the reports are less favorable than those of Holth himself who records 75 to 85 per cent of cases with satisfactory cystoid scars. Schioetz, on the other hand, obtained only 28 per cent of satisfactory scars.

*Borthen's iridotaxis* (34) is the most important modification of Holth's method. Borthen does not incise the iris but draws it into the wound so that the posterior surface of the iris lies against the conjunctiva with the sphincter well beyond the scleral opening. He uses atropine so that the sphincter will be paralyzed and not tend to draw the iris within the wound. This operation is not advised in the presence of an atrophic iris. Comparison of 26 cases of iridotaxis with 26 done by Holth's method convinced Borthen of the superiority of iridotaxis. Roy (35) has reported favorably on 9 operations after Borthen's method. He emphasizes the importance of a small opening into the anterior chamber, just enough to admit the iris forceps, so that the iris is held within the wound and does not slip back into the anterior chamber. Roy has not used atropine; he is



pleased with the simplicity of the operation and the lack of post-operative irritation. He quotes a personal communication from Borthen stating that the latter has performed iridotaxis 242 times since 1908 and finds no need of using any other method. Borthen considers the good results due to the increased drainage through the spaces of Fontana in consequence of the stretching of the iris, rather than to the type of cicatrix. Mayer (36) has sought to accomplish the same end by making an iridodialysis through pulling on the iris with two pairs of forceps and placing the loop of iris thus torn from its base within the scleral wound. He leaves it so for one week, when he cuts off the protruding part. Harrower (37) records 7 cases of iridotaxis with good results in every case.

*Foreign-body drains.* Another type of glaucoma operation which promises some usefulness is the insertion of a foreign-body drain beneath the conjunctiva and in the anterior chamber. Mayou (38) in 1912 utilized a short thread with a knot tied in it. He pushed the knot into the anterior chamber, leaving the two ends of thread in the subconjunctival space with the flap of conjunctiva carefully replaced over it. Zorab (39), in the same month, reported his operation of aqueoplasty which differs from Mayou's operation only in the fact that the loop of thread passed into the anterior chamber has no knot in it. The gradual absorption of the thread is thought to leave a fistulous track for the drainage of aqueous into the subconjunctival space. Casey Wood (40) (1915) has modified these procedures in the following manner: He uses a narrow Graefe knife with a hole in the end of the blade like the eye of a needle. After puncture and counter-puncture in the usual way he threads the knife blade with silk and withdraws it through the same openings leaving a double thread in the anterior chamber. The loop of thread is now cut, freeing the knife; thus four ends of thread are left, two on each side, which are threaded to small curved needles. Each needle is passed as far as possible through the episcleral tissues, each in a different direction. Each thread is now cut at its emergence from the conjunctiva. Four paths of exit for aqueous are thus made by the gradual absorption of the silk. Arthur Prince (41) makes use of a gold horseshoe-shaped wire, passing it into the anterior chamber with the ends resting in the scleral wound, which is made by either the Lagrange or Elliot method. Vail (42) has recently reported an experience in 1907 with a case of absolute glaucoma in which he in-

serted a silk thread through Tenon's capsule into the vitreous. This resulted in normal tension and absence of pain for a period of two years until the patient's death. Vail suggests the advantage of utilizing a natural channel of drainage, such as Tenon's space, and avoiding a thin conjunctival covering.

These operations offer the theoretical objection of a foreign substance left within the eye which may excite inflammatory reaction. More time must elapse before any opinion can be expressed in regard to their effectiveness and safety.

This résumé by no means exhausts the list of operations suggested for the relief of glaucoma. It merely covers the more important procedures which are practiced at the present time, together with some which are too new to admit of any conclusions. It would be a bold attempt to pass final judgment on the popular operations which have been described; indeed dogmatic statements on the surgery of glaucoma are decidedly out of place. One may hope rather to point out some general principles that seem to be well established and to present the favorable and unfavorable experiences with the several types of operation now in vogue as they are recorded in the literature.

The simple procedures, as posterior sclerotomy and paracentesis of the cornea, still have a place, and probably always will, as valuable temporary expedients for lowering intra-ocular tension until certain transitory causal factors of hypertension cease to operate, and as a preliminary to more radical measures. Massage of the globe deserves a place among these temporary measures. The fulminating type of glaucoma sometimes requires such preliminary treatment before iridectomy can be safely done. The secondary glaucomas can be tided over by such comparatively simple measures until the primary condition is brought under control. The severe pain of absolute glaucoma may be relieved by evacuation of ocular fluids and enucleation sometimes avoided. Acute exacerbations in chronic glaucoma can be likewise handled.

*Inflammatory glaucoma* has always been the most favorable type for cure by iridectomy. This type is of the nature of an inflammatory oedema shutting off the exit of aqueous by the apposition of the iris to the cornea at the angle of the anterior chamber. Removal of a large piece of iris well back at its ciliary attachment is a logical means of removing this obstruction. Results are prompt and permanent in a large majority of cases. It is reasonable to expect



a degree of vision nearly equal to that which existed previous to the attack. The earlier the operation the better the prognosis. An atrophied iris contra-indicates the operation, as does a very much contracted field of vision.

If all glaucoma were inflammatory the search for operative means of controlling it would probably have gone no further; but the less favorable results of iridectomy in simple glaucoma have created a need for other operations and these operations have been tried also in the inflammatory type. These facts illustrate a tendency, not altogether fortunate, to extend the use of surgical procedures beyond the purpose for which they were first designed and to bring disrepute upon measures which are entirely proper when not misplaced. Thus the Elliot trephine operation and the incarceration methods have been practiced, not only in simple glaucoma in which there has been urgent need for some more effective treatment than iridectomy, but also in acute inflammatory glaucoma. Such a series of cases as that of Grosz, 237 cases, in which 96 per cent of those iridectomized in the prodromal stage and 87 per cent in the acute stage were successful, would convince most surgeons that no more is to be expected from other types of operation than from iridectomy. On the other hand, the results of some of the newer operations would justify their use by operators who have mastered their technique if there were no greater dangers incident to these operations than to iridectomy. Unfortunately, however, there is the danger of subsequent infection through the thin covering of conjunctiva which is the only protection to the interior of the eye in the operations which secure a cystoid cicatrix. It is too early to say just what place these operations may come to occupy in the treatment of acute glaucoma; but for the present it seems wise to depend upon iridectomy in this type of case rather than to risk the danger of late infection after another operation which has not yet proved its superiority. Thus Butler and Evans (43) report a series of 70 cases of acute and subacute glaucoma in which normal tension was secured in 88 per cent after iridectomy and in 82 per cent after various of the newer scleral operations. In the latter cases these authors call attention to the accompanying iridectomy which they believe to be the secret of the good results.

Certain cases of inflammatory glaucoma present technical difficulties to the performance of iridectomy and Heine's cyclodialysis may be utilized instead; for example, the fulminating type in

which the anterior chamber is obliterated and an iridectomy is impossible, and when old people must be operated on who cannot be safely kept in bed. Cyclodialysis is not to be regarded as a satisfactory substitute for iridectomy, but may be a necessary expedient to secure a greater effect than the simple punctures of the sclera or cornea.

*Glaucoma simplex* presents a larger and more difficult problem. This is not the place to enter upon a discussion of the relative merits of medical and surgical treatment for this type of glaucoma. Suffice it to say that there is a considerable trend of opinion in favor of miotic drugs to control tension in these cases. The facts that such drugs are sometimes inadequate and always entail tedious and prolonged administration, which few individuals will or can submit to, militate against their use without operative intervention. The question therefore is pertinent, What is the operation of choice in simple glaucoma?

The lack of such brilliant results from iridectomy in this type of glaucoma, as in the inflammatory type, must not be taken to mean that iridectomy is of no avail. Hallauer's figures, showing 80.5 per cent with tension reduced to normal and 31 per cent of recurrences, disprove such an idea. Butler and Evans record 91 cases of chronic glaucoma with 70 per cent showing normal tension after iridectomy and 87 per cent showing normal tension after trephining. These figures indicate the considerable degree of effectiveness of iridectomy and the greater value of a cystoid cicatrix. Rochon-Duvignaud (44) states that about 70 per cent of trephine cases in simple glaucoma and chronic glaucoma with inflammatory intermissions are successful. Butler records 23 successful cases in 29 operated upon by Holth's punch method which he preferred to all others in 1909. Morax and Fourriere (45) considered Holth's the method of choice and Elliot's next. The value of statistics would be greater if more explicit terms than "successful" were used. It is evident that the past decade has witnessed an important development in the surgery of chronic glaucoma. That a cystoid cicatrix secures drainage of ocular fluids sufficient to keep intra-ocular tension within safe limits, and does this more effectively than iridectomy in this variety of glaucoma, is now an established fact. Which of the numerous procedures designed to make such a filtering wound is to be preferred may not be stated with such positiveness.

Elliot believes his operation possesses very



distinct advantages in practically all cases of glaucoma. Lagrange has emphasized the limitations of his operation and insisted that it be not used as a substitute for iridectomy in cases which are most suited to the latter. He reported 84.4 per cent of successes in glaucoma simplex. Meller (46) has made a valuable report on a large series of cases, comparing the Lagrange and Elliot procedures. The Lagrange operation was performed 389 times, the Elliot trephining 178 times. Good results (by which he means sight preserved or, if already lost, the globe preserved with normal tension) followed in 69 per cent of the Lagrange operations and in 72 per cent of the trephined cases. The cases terminating badly were grouped together showing 8.4 per cent in the Lagrange operations and 2.4 per cent in the Elliot. Meller was impressed with the complications of the Lagrange method and concluded that the smaller scleral opening far forward in Elliot's method is a distinct advantage. He found the accompanying iridectomy an important defense against prolapse. He is optimistic about these operations for all cases in which iridectomy is not emphatically indicated; this includes absolute glaucoma, secondary glaucoma, and buphthalmos. He credits Lagrange with having paved the way for the safer Elliot procedure. Late infection occurred in 1.5 per cent of the Lagrange cases and in 1.7 per cent of the Elliot cases. The fact deserves mention, supplementing Meller's report, that the Holth punch-forceps operation eliminates the chief objections to the Lagrange method, with the exception of the necessity of entering a narrow anterior chamber with a knife (which the trephine avoids), and has been used with great success by some operators. Reber (47) feels distinctly more hopeful since the introduction of the Elliot operation. He secured improvement of vision in 15 of 26 cases after this operation; some vision in eyes which were blind when operated upon in 5 cases; and cessation of pain in 6 eyes with absolute glaucoma.

The choice of some one of these procedures for securing a cystoid cicatrix is a matter of individual preference on the part of the operator. Whether the incarceration of iris in the wound is an advantage over an iris-free cicatrix is a question which time must answer. Elliot's, Lagrange's, Borthen's, and Holth's two operations are just now enjoying much popularity. That possibilities exist of a high degree of development of technique in these procedures is indicated by the fact that the chief objection to the cystoid cicatrix,

late infection of the wound, seems not to be met with by the originators of these operations, while other surgeons are encountering such mishaps.

The question of infection through the thin conjunctival covering of the scleral opening is a serious one. While intact conjunctiva is an effective barrier against micro-organisms, it is entirely possible that slight trauma may at any time cause a minute break in the bulging conjunctiva which is constantly pressed against by the lid. The first enthusiasm created by the excellent results of these various operations in glaucoma simplex was considerably dampened by occasional reports of such infections. Up to January, 1914, thirteen cases were recorded. Gifford (48) has discussed these at length. Numerous cases have since been added to the literature, important observations being made by Schur, Kuhnt, Axenfeld (49), and others. Paul had collected 28 cases prior to May, 1914. Some surgeons have been led to abandon these operations on account of the fear of late infection. The most gloomy view has been expressed by T. Harrison Butler (51) who concludes an article entitled "The Tragedy of Sclerostomy" with the words: "Late infection is a peril which hangs like the sword of Damocles over every eye which possesses a filtering cicatrix of any type, however obtained." His eight cases are divided into three classes: (1) acute cases ending in uveitis and panophthalmitis necessitating the removal of the eye; (2) cases of severe iridocyclitis which destroy the sight; (3) cases of mild iritis and local inflammation around the aperture which recover. On the other hand, Elliot calls attention to the fact that cases of infection must be judged with regard to the ratio they bear to the total number of cases trephined, of which some 500 had been recorded up to October, 1914. He makes the following observation: "The condition for which we trephine is not one in which the patient can choose whether he will be operated upon or not. He has his back to the wall, and we are fighting for his sight. Risks are then justifiable which would not be worth taking for an operation for cosmetic purposes."

It is impossible to make a generally acceptable statement in regard to late infections. There is no uniformity in experience as yet justifying a final word on the subject. Certainly we cannot be as sanguine in regard to glaucoma simplex as the earlier reports on the new operations seemed to warrant. Yet, we cannot fairly offer wholesale condemnation of operations which produce excellent results in a difficult type of disease to

treat, just because a small percentage of the cases suffer from infection at the site of the wound in after months or years. Glaucoma simplex will for the present be combated by means of one of the operations which secure a cystoid cicatrix in the hands of surgeons who are convinced that more cases can be cured by these procedures, after deducting those which later become infected, than can possibly be cured by any other means. This type of glaucoma will not be attacked by means of these procedures in the hands of other surgeons whose fear of late infections leads them to prefer iridectomy or the more temporary expedients coupled with massage and miotics. When cystoid cicatrices are made, patients will be warned that an element of danger exists and precautions taken by frequent irrigation of the conjunctival sac and periodic visits to the ophthalmologist. It seems today that the prognosis of glaucoma simplex is distinctly better, as a result of the scleral operations available, than it was ten years ago. For a careful exposition of this subject by a master of ophthalmic surgery, the reader should consult the textbook of the late Dr. Charles H. Beard (52).

There remain several other types of glaucoma concerning which a few words are necessary.

*Hæmorrhagic glaucoma* does not yield to iridectomy or to the newer scleral operations. There is great danger of destructive hæmorrhage following these methods. Anterior sclerotomy is safer as a temporary measure, and may be repeated. Heine's cyclodialysis may be made following posterior sclerotomy. Unfortunately enucleation is the frequent end-result of all forms of treatment.

*Absolute glaucoma*, the condition of stony hardness of the globe and extreme pain, may be rendered comfortable at times by posterior sclerotomy, and by trephining. These procedures may delay or prevent enucleation.

*Secondary glaucoma* demands the vigorous treatment of the primary condition. Temporarily, the transient punctures of the sclera are utilized; Heine's cyclodialysis promises more prolonged effect.

*Buphthalmos* is notoriously resistant to all treatment. Anterior sclerotomy may be done repeatedly. Fage (53) reports 14 cases in which this operation gave normal tension and 5 cases in which the growth of the eyeball was checked. Zentmayer (54) has compiled the experiences of a number of surgeons by means of a *questionnaire*, and concludes that some form of sclerectomy is the best procedure; of these the Elliot trephining

seems to be preferred. Heine's cyclodialysis has also given some good results.

A discussion of the surgery of glaucoma at the present time must lack finality. The past decade has been fruitful of many ingenious attempts to solve the difficult problem of saving vision in a peculiarly baffling disease. Time will sift these operations, selecting the more effective and less dangerous ones for use chiefly in glaucoma simplex. Just now it is more important to study the problem with an open mind than to espouse the cause of any one operator or operation.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

#### OPERATIVE SURGERY AND TECHNIQUE

**Shaw, H. A.:** Infolding and Peritonealizing Stitch with Application of the Same to Broad Ligament and Gall-Bladder. *Surg., Gynec. & Obst.*, 1916, xxii, 731.

Shaw condemns the technique of cholecystostomy as advocated by Williams in SURGERY, GYNECOLOGY AND OBSTETRICS, January, 1916. He applies what he calls an infolding and peritonealizing stitch. The advantages claimed for this stitch as summed up by the author are:

1. Conservation of tissue. In cholecystostomy we are endeavoring to preserve the gall-bladder and restore its function. By this method we certainly do not greatly diminish the capacity of the gall-bladder.
2. There is no dead space.
3. It produces perfect inversion in a simple, rapid, and efficient manner.
4. It renders easy the accurate insertion of the drain to just the correct depth. The tack suture in the drain serves the double purpose of fixing it *in situ* and assisting in preventing eversion of the cut edge.
5. By cutting loop and pulling and tying from both directions, it produces smoother and easier traction and a more symmetrical and tighter purse-string around the drain.

The practice of suturing the drain to the abdominal wall is condemned for the following reasons:

1. It does not allow for the natural mobility of the liver which assumes a somewhat different position, according to posture.
2. The liver to a certain extent participates in the respiratory excursion. Therefore, it is unwise to fix the drain to the moving parts, i. e., the abdominal wall and liver.
3. The abdominal stitch is applied after the wound is closed and is almost sure to draw the gall-bladder upward or force it into an untoward position.

Shaw then proceeds to apply this stitch to the technique of salpingo-oophorectomy claiming that the special indications of (1) bloodless removal of the mass, (2) closure of the gaping defect in the broad ligament, and (3) peritonealization of denuded areas are all accomplished with rapidity and ease by this

method. He illustrates this procedure by anatomico-schematic diagrams.

**Arana, G. B.:** The Intradermic Suture; Its Technique (La sutura intradérmica; su técnica). *Semaine méd.*, 1916, xxiii, 625.

The author discusses the value of intradermic sutures from the cosmetic standpoint in leaving the smallest possible amount of scar on the skin. Chassaignac introduced this suture method in 1851 under the name of cellular or subcutaneous sutures, and in 1890 Kendal Franks, an English surgeon, revived them under the title of subcuticular sutures, which although not substantially different from Chassaignac's, yet coming in the period of antiseptic procedures claimed more particular attention. Since then the method has been popularized by Pozzi and others.

Since a minute description of the technique of intradermic suture is not given as far as Arana can discover from an extensive search in any published work or society report, he describes this technique in the greatest detail and illustrates the various steps of the method so as to make them clearly intelligible. He thinks that this intradermal suture is the only one which is capable of giving a simple linear cicatrix.

With the technique used he considers that longitudinal stitches are best. Horsehair is used with a Hagedorn needle. It is necessary to obtain a practical acquaintance with the details of the technique as practiced in the operating room. The time consumed is no more than that required for ordinary suturing. Prior to the intradermic suture a continuous suture of the cellular fatty tissues is made, which will avoid subsequent hæmatomata.

Intradermic suture is indicated in all cases where it is desirable to hide a cicatrix and it is formally indicated in interventions in the face, neck, and breast and other visible parts, especially in women. It is employed exclusively in operations which heal by first intention. The method is contra-indicated in septic operations or in cases in which the general state of the patient does not permit of cosmetic considerations. In some cases there may occur as an exceptional result an exuberant cicatrix where the skin is overirritable or very fine, and in such



cases it is necessary to re-operate as the relapse of such an exuberant cicatrice is fatal.

W. A. BRENNAN.

**Shorten, J. A.: Continuous Irrigation of Wounds in the Field.** *Indian M. Gaz.*, 1916, li, 131.

The author has devised an ingenious apparatus for continuous irrigation in the field. An empty kerosene tin is placed on a suitable stand and rubber tubing used to siphon the fluid from the can to the wound. By means of adhesive plaster the catheter at the end of the tube, is fastened at the desired depth in the wound. The patient's bed is then inclined and the patient turned on his side so as to drain the irrigating fluid and discharges into a rubber sheet draining into a bucket. J. H. SKILES.

**Black, C. E.: Some Experiments with Rubber Gloves.** *Surg., Gynec. & Obst.*, 1916, xxii, 701.

This paper consists of a series of observations on the sense of touch, in the use of rubber gloves. The author selected six high-school students at the Illinois State School for the Blind—3 boys and 3 girls—and had them read a given amount of text (100 words of unfamiliar text) with various weights of gloves, and with gloves put on dry, wet, and with the hands oiled, gloves which were well fitted and gloves which were loosely and poorly fitted. These various observations were compared with the sense of touch with the bare fingers under the same conditions. The following are the author's conclusions:

1. The use of medium weight rubber gloves requires the blind to use an average of 22 seconds more in reading 100 words of Braille than with the bare fingers; namely, 48 seconds with the bare fingers and 70 seconds with medium weight gloves. Or in other words, there is a loss of nearly 50 per cent in the sense of touch judging from the results of this experiment.

2. The tactile sense is materially improved by putting on wet instead of dry gloves, the difference being an average of five seconds, or a little less than 10 per cent. Gloves put on with oil on the hands give a slight improvement over dry gloves; namely, 68 seconds as against 70 seconds.

3. The tactile sense diminishes in direct proportion to the thickness of the gloves as shown in our first series of observations where thin gloves showed an average of 71 seconds, thick gloves showed an average of 106 seconds as against an average of 48 seconds with the bare fingers.

4. A marked improvement in the tactile sense is brought about by the use of carefully fitted gloves as shown in the second series where, by care in fitting, the average was reduced from 70 seconds to 66 seconds.

5. As a final conclusion we may say that the final result of the experiment is that gloves put on wet give the most favorable opportunity for exercising the sense of touch and gloves put on dry give the least favorable.

**Bartlett, W.: A Clinical and Experimental Study of Post-operative Ventral Hernia.** *Tr. Am. Gynec. Ass.*, Washington, 1916, May.

The causes of post-operative ventral hernia are incisions in defiance of anatomic and physiologic principles, improper wound closure, needless drainage and tamponade, post-operative increased intra-abdominal pressure, and wound infection.

Experiments on dogs produced no sign of hernia where one layer was preserved. Hernia resulted where a defect was produced in all layers, except skin, or skin and peritoneum, successful repair of these being made by inversion of the opposite sheath, overlapping of both sheaths, or fascia lata transplantation.

Complete defects were immediately repaired with transplants of fascia, sheath transplants, or the reflection of opposite sheaths.

To restore the abdominal wall in these hernias, only one to three fibrous layers were depended upon.

The experiments proved that post-operative hernia depends upon two factors: weak wall and hernial tendency.

In the human subject the hernial tendency is corrected pre-operatively by reducing intra-abdominal fat and intestinal contents, with rest in bed, liquid diet, and free catharsis.

The best operative procedure leaves the sac intact, utilizing sac wall and scar tissue, but if necessary the abdominal contents may be reduced. If there is undue tension on the reconstructed wall, or interference with the movements of the lower ribs, failure is certain.

Choice of operation depends upon the site of the lesion, the size of the opening and the hernia, the condition of the surrounding tissue, and the general condition of the patient.

The varieties of operation are: overlapping, reconstruction, flap inversion, filigree, and free transplantation.

Kirschner prefers fascia lata because of its easy accessibility in quantity, its strength, inelasticity, adaptability, and tendency to heal in.

One reinforcing suture line outside or one inside and outside a complete defect practically insures success.

The after-treatment is of vital importance, dealing chiefly with meteorism or straining of any kind.

In the clinical series of 78 operations, the results were not known in 7 cases, 2 treated with filigree were failures, 4 had recurrences after the use of the overlapping method, while the others were all complete cures.

**McNeile, O.: Pre- and Post-operative Care.** *Calif. St. J. Med.*, 1916, xiv, 189.

During the past few years many sporadic attempts have been made to standardize the care of the surgical patient, both before and after operation. The attempts have nearly always failed to elicit any enthusiasm, either because the collaborator had tried to introduce some theoretical methods, or

because surgeons, as a class, lay more emphasis upon operative technique than upon details of pre- and post-operative care. This lack of detail is probably the cause of many poor surgical results.

In this paper the author covers the entire ground of routine pre- and post-operative care in pelvic and abdominal operations upon women. It has been his practice, during the past five years, to gradually work up a printed order blank which is left on the patient's chart in the hospital. Enough blank spaces for orders covering individual variations are left on this record, but, in general, the treatment is very nearly routine.

EDWARD L. CORNELL.

### ASEPTIC AND ANTISEPTIC SURGERY

**Maurel: The Method of Action of Certain Antiseptics and of Procedures for the Determination of Their Therapeutic Value** (*Du mode d'action de certains antiseptiques et des procédés destinés à apprécier leur valeur thérapeutique*). *Bull. Acad. de méd.*, Par., 1916, lxxv, 481.

Maurel calls attention to the results of his experiments, published 25 years ago, on the leucocytes of the blood, which in the light of recent researches on antiseptics have, he believes, a new significance. The results summarized are as follows:

1. That the pathogenic power of microbes appears to depend on two series of products, one series due to their surroundings and the other to their own substance.

2. The product due to their substance has a strong elective action on the leucocyte. It is leucocytocidal.

3. According to Maurel's researches certain physical and chemical agents can diminish the action of this leucocytocidal power considerably and help the leucocyte to resist.

4. The diminution of the leucocytocidal power of a microbe can be very marked without its reproductive power being sensibly modified.

5. Iodoform, iodine solutions, and mercury bichloride solutions can have a very marked effect on the leucocytocidal power of microbes, or at least on certain ones.

6. It may be concluded, therefore, that in order that an antiseptic agent may have a useful effect on the organism invaded by a microbe, it is not necessary that the antiseptic kill the microbe or even that it hinder its reproduction. It is sufficient if it diminishes its leucocytocidal power sufficiently that the leucocyte can triumph.

W. A. BRENNAN.

**Quénu, E.: The Manufacture of Catgut** (*La fabrication du catgut*). *Bull. Acad. de méd.*, Par., 1916, lxxv, 539.

The question of catgut is such an important one in surgery that the Paris Academy of Medicine appointed a special commission to consider and report on the condition of its preparation.

Since Pasteur's discoveries objections have been made to catgut as a suture material and although various attempts at sterilization have been made,

laboratory experiments have demonstrated that phenic acid, chromic acid, and sublimate have failed to completely sterilize catgut, and some surgeons, including Kocher and Terrier, renounced its use.

Répin's memoir in 1894 showed the futility of existing methods of sterilization and the use of alcohol vapor under pressure was recommended. It was pointed out that sterilization should commence with the preparation of the string in the first stages. Répin's method more or less modified is still in use.

The researches instituted by Goris and reported to the Academy early in the present year, based on the intimate examination of different lots of catgut, showed that neither tyndallization in alcohol at 90°, iodine, nor subjection to heat completely sterilized certain strands of catgut. Laboratory experiments therefore verified the fact clinically observed that infection was possible from so-called sterilized catgut.

The general conclusion of Goris from his observations is that the surgeon who is responsible to his patient must not rest satisfied with the ordinary pharmaceutical sterilization, but must go back to the manufacture of the string itself in order to be assured that the catgut submitted to sterilization is actually sterilizable.

In France the principal centers of manufacture are at Paris and Lyons. The prime necessity in the manufacture of sterilizable catgut is the use of fresh healthy intestines. In Paris alone the entrails of 1,500,000 sheep are required annually and at Lyons the slaughter of nearly 225,000 is insufficient for the requirements of the catgut trade. Hence, it is necessary to resort, as in Germany and elsewhere, to importation of dry and fermented gut, and the first requisite, i.e., sanitary inspection of the sheep at the abattoir, is lacking. The difficulty of obtaining sterilized surgical catgut is accentuated when it is remembered that sterilization is not so much an object of concern to the manufacturers inasmuch as nineteen-twentieths of their output is destined for the musical instrument trade.

The commission believes that special treatment is essential from the very beginning in the preparation of surgical catgut; following immediately on the death of the animal, the intestine should be examined, washed, and placed in refrigerators, removed as quickly as possible to the catgut factory in not less than from twelve to fifteen hours after slaughter and transported in ice. On arrival at the catgut factory, the intestines should be immersed in oxygenated water and split into strands or strips and then submitted to the sterilizing processes.

A special apartment in the catgut factory is necessary for surgical catgut and the necessary precautions must be observed in every phase of the manufacture and drying of the strands to prevent contamination of the intimate parts of strands either from the personnel of the workmen or from the surroundings.



The report of the commission discusses finally the precaution to be observed in the pharmacal sterilization and preservation of the sterilized catgut. The commission expresses the opinion that Répin's recommendation that the sterilized catgut suture material be preserved in bouillon and not in antiseptic fluids is the most adaptable to the greater part of the sterilization procedures; and that such a tube of catgut carries with it the irrefutable proofs of its purity.

W. A. BRENNAN.

### ANÆSTHETICS

**Hering, H. E. von.: Sudden Death in Chloroform Narcosis** (Der plotzliche Tod in der Chloroform-narkose). *Muenchen. med. Wchnschr.*, 1916, lxxii, 521.

For the past four years Hering has called attention to his own findings from animal experiments that sudden death in narcosis, particularly chloroform narcosis, is due to heart-flutter. A review of the literature of the past twenty-five years shows that this is fairly well established.

Cats and dogs may die suddenly in the beginning of chloroform narcosis and the sudden death in such cases is due to over excitation of the cardiac chambers. In man unquestionably the same thing is true whenever at the beginning of narcosis the heart action is no longer evident and even if respiration has not stopped. In such sudden deaths in man excitation plays its part.

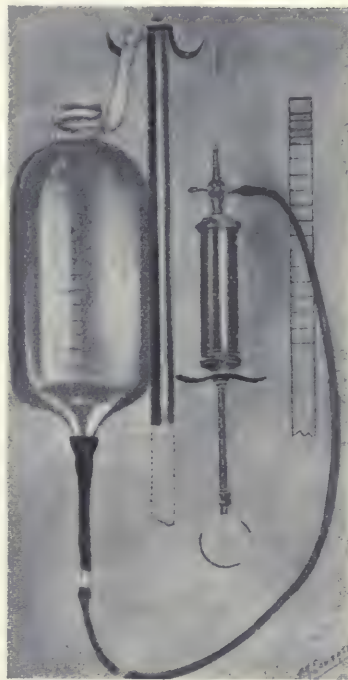
Since extrasystole can be placed in the same category of heart irregularities as heart-flutter and may even change into it, on the grounds of animal experimentation chloroform should not be administered to patients with extrasystole, even when such extrasystole is sporadic only. Moreover, since the existence of latent extrasystole can easily be determined, chloroform narcosis should be avoided.

W. A. BRENNAN.

**Bartlett, W.: A Method of Facilitating Infiltration Anæsthesia.** *Ann. Surg.*, Phila., 1916, lxxiii, 678.

In order to avoid loss of time and energy to the operator, as well as discomfort to the patient, due to the reintroduction of the needle, a number of forms of apparatus have been devised to facilitate the administration of local infiltration anæsthesia. The accompanying cut represents a method which Bartlett has found very efficient and which is very simple. While original with him, a similar apparatus was described by Braun in the second edition of his book. After the usual intradermal injection with a fine hypodermic needle, a 9-cm. needle is introduced and a field 18 cm. in diameter can be infiltrated without withdrawing the needle. The graduated container, A, is filled with 500 to 1000 ccm. of a one-half per cent solution of novocaine to which has been added 1 ccm. of adrenalin 1:1000 for every 200 ccm. of novocaine. By means of the two-way cock, C, the 10-cm. metal syringe, B, can be emptied and filled as rapidly as the piston can be forced in and out.

GATEWOOD.



Apparatus for administration of infiltration anæsthesia.

**Leavitt, M. A.: Rectal Anæsthesia.** *N. Eng. M. Gaz.*, 1916, li, 248.

The indications for rectal anæsthesia are operations around the head, neck, and chest, where the element of fear is in evidence.

The method of procedure is as follows: The rectum is prepared by the administration of a cathartic the evening before, followed by enemata and suppositories of chlorotone to anæsthetize the rectal mucosa. Twenty minutes after the insertion of the chlorotone, morphine and atropine are given hypodermatically and twenty minutes later a mixture of oil and ether is introduced, in the proportion of 50 to 75 per cent of ether and 50 to 25 per cent of oil. One ounce of the mixture is given for every twenty pounds of body weight, not to exceed eight ounces, through a rectal tube at the rate of one ounce a minute. In from 10 to 55 minutes the patient goes to sleep. The length of the anæsthesia varies from two and a half to three hours, but it may be shortened or lightened by withdrawal of the mixture through a rectal tube. After operation the bowels are massaged and cold water irrigations given to remove the oil and ether. Intravenous injections of normal saline solution may be given if the anæsthesia is too deep.

In only one case was complete failure experienced in the same individual twice. This was thought to be due to resistance to any form of anæsthesia. No untoward results have occurred.

E. K. ARMSTRONG.

## SURGERY OF THE HEAD AND NECK

## HEAD

**Morestin, H.: Very Extensive Shell Wound of the Face; Gradual Reduction of the Ensuing Deformity by Successive Extirpations of the Cicatrix** (Plaie très étendue de la face par éclat d'obus; réduction graduelle de la déformité consécutive par extirpations successives de la cicatrice). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1005.

In this article illustrated by photographs which show the very excellent results obtained in a plastic operation for extensive shell wound of the face, Morestin calls special attention to the benefits of successive interventions, reducing bit by bit the extent of the cicatrized surface and the mass of sclerous tissues. His knowledge of this gradual method of reduction is based on hundreds of cases of cicatrices and mutilations of the face in his special service. The method is simple as regards manipulations, requires patience and time, but gives excellent results, and the author thinks it should play an important part in modern plastic surgery. The method is described in detail.

W. A. BRENNAN.

**Eve, F.: Some Surgical Procedures in Gunshot Fractures of the Mandible.** *Practitioner*, Lond., 1916, xcvi, 447.

The author tells of his experience while in charge of the surgical side of a military hospital of 350 beds for eighteen months. In many cases the disabilities were present prior to enlistment, but many were accentuated by the unaccustomed physical strain of a soldier's life.

Seventy-one cases of inguinal hernia were operated upon, the Bassini method being used in all except three cases.

Two cases of femoral hernia were also operated upon, Poupart's ligament being stitched to the pectineal fascia. The after-treatment consisted of twenty-one complete days' rest in bed, and the patient was not allowed to resume active duties until three months after the operation.

Sixty-three cases were admitted for operation for varicocele. The high operation over the external ring was done in each case with a vertical incision. These men were kept in bed fourteen days and were given a subsequent furlough of twenty-eight days.

Ten cases of hydrocele were operated upon.

Forty cases of varicose veins were treated surgically.

Thirty-four cases of malformation and malposition of the little toe were operated upon, amputation of the toe being carried out through the metatarsophalangeal joint.

Twent-one cases were operated upon for hammer-toe by removal of the toe.

Four cases were operated upon for hallux valgus and rigidus; excision of the head of the first meta-

tarsus was performed in each case. In all but one case there was little or no improvement.

Twenty-one cases suffering from ingrowing toenail were admitted for operation. The simplest method and one which gave very satisfactory results was to remove the whole of the nail and scrape the nail-bearing area under general anæsthesia.

Twenty-three cases of hæmorrhoids were subjected to operation, the suture method being preferred.

Twenty-four circumcisions were performed for phimosis or paraphimosis.

Twenty-four tonsil operations were performed, sometimes with the removal of adenoids.

Two cases of internal derangement of the knee-joint were operated upon by resection of the internal semilunar cartilage.

Four cases of undescended testis were operated upon by castration.

Eight cases of fistula in ano were subjected to operative treatment.

Five men with lipomata were operated upon under local anæsthesia.

Thirty cases of acute appendicitis were admitted, of which twenty-four were operated upon. There was one death from general peritonitis from perforation of the appendix.

One case of otitis media was admitted which terminated fatally, following a temperosphenoidal abscess.

One case of empyema following pneumonia was operated upon with satisfactory results.

J. H. SKILES.

**Baldwin, M., Payne, J. L., Hayes, G. B., and others: Discussion on War Injuries of the Jaw and Face.** *Proc. Roy. Soc. Med.*, 1916, ix, Odontol. Sect., 63.

BALDWIN opens the discussion by describing the term, "war injuries of the jaws," and the effect of impacts from projectiles on the jaw.

Frequently the bone is not only fractured, but comminuted, causing a deviation of these fragments, further complicated by the contraction of scar tissue and the formation of adhesions if the jaw be improperly treated, or not treated at all. Facial deformities result, and the patient's life is made miserable by dribbling of saliva, obstruction of breathing, and many other annoyances. To correct these troubles, apparatus must be used in the mouth, which brings the work inevitably within the sphere of the dental surgeon or stomatologist. Baldwin visited Paris and Lyons, and found in each of these cities admirable organization of the jaw treatment, and, usually, a dental surgeon at the head of each establishment. At Lyons, he found, under Dr. A. Pont, 830 jaw cases assembled in six large hospitals. Early in the war, the lack of stomatologi-



cal service was shown by the number of bad results in these cases. In England, there exists, at this time, but one military hospital especially set aside for jaw cases. Baldwin believes that it would be well to have such a special hospital in the district of each command in the United Kingdom, and states that the dental and stomatological arrangements of the British army have always suffered from the lack of an experienced officer on the staff of the director general.

Payne, relating his personal experience, stated that he has treated 22 patients, and, in addition, he visited France in August and December, 1915, where he saw large numbers of soldiers suffering from every description of jaw injuries, under treatment. The chief trouble, he thinks, is nearly always with the mandible, which is recognized as being the most used bone in the body. It is more liable to serious damage in consequence of its exposed position, its loose attachment to the skull, and the action of powerful muscles, and the displacements also tend to be relatively greater than in other bones of the body. The mere use of bandages and other external appliances seldom avails to correct this deformity. He suggests the division of these cases into the six following types:

1. Fractures of the mandible without displacement of the line of occlusion.
2. Single fracture of the mandible with lateral displacement.
3. Single fracture of the mandible with vertical displacement.
4. Two or more fractures of the mandible with loss of substance.
5. Gunshot wounds of the maxillæ.
6. Fractures involving loss of the anterior portion of the mandible or the maxillæ, or the whole of one side, together with the soft tissue adjacent.

These types are fully described and numerous illustrative cases cited. In answer to the question, "At what period after the injury should the aid of the dental surgeon be called in?" he answers: "I should emphatically say that it should be done as soon as possible after the wound has been inflicted, and I believe that there should be co-operation between the general surgeon and the dental surgeon, the dental surgeon beginning his work immediately after the patient has recovered from the condition of shock." Efficient drainage is the first essential principle of treatment. Skiagrams should be taken at the commencement, during, and at the conclusion of the treatment. Teeth should be freed from tartar, blood, and food. Carious teeth should be temporarily filled; septic roots and teeth should be extracted as soon as possible, and any tooth that is situated in the line of fracture usually has to be sacrificed, or union may be delayed. The application of a splint should follow as soon as it can be borne by the patient; often the temporary appliance may be replaced by a permanent splint when conditions look more favorable. In displacements of the maxillæ, support may be obtained by

simple bandages or by means of suitable appliances. After sepsis has been controlled, the next important step in the treatment is to restore what may remain of the masticatory apparatus by bringing back the fragments of bone into a position which permits of normal occlusion. The treatment may be divided into the four following stages:

1. Reduction of displacement of bony fragments.
2. Retention of these fragments in the position which allows of normal occlusion.
3. Reduction of cicatricial contraction, the restoration of muscular equilibrium, and the remoulding of the facial contour.
4. Fitting of a permanent prosthetic appliance, the simpler the better, so long as it is clean and efficient.

The aim of prosthetic treatment should be: (1) to correct the deformity and to restore the teeth to the position of normal occlusion; (2) to retain the fragments in this position until reunion has occurred; (3) later, some form of denture may have to be fitted to make good the gaps left by lost bone and teeth, and to restore the functional activity of the jaws. The idea that an interdental splint, at an early stage, will tend to promote sepsis, he believes to be entirely erroneous. During the third stage of the treatment, frequent massage, both manual and electrical, by competent nurses, should be adopted to restore muscular equilibrium, and care should be taken to guard against cicatricial contraction.

HAYES states that no pathological problems or conditions have been met with in this work, the difficulties encountered being due to the variety and complexity of conditions presented, which demand the most careful consideration. The principal treatment in these cases he believes, falls upon the dental surgeon, and the ultimate success depends upon the building up and restoring of the jaws as a skeleton or framework upon which the final plastic operation is performed. Much has been done, but much remains to be done to supplement the special centers already created for this work in France. There should be dental surgeons at the front to give first aid to these cases and to decide what remaining fragments of jaws and teeth shall be saved and what removed. There are many questions involving the treatment of these wounds now undergoing renewed and general study.

HOTZ also ventures the opinion that in all jaw cases combined with extensive destruction of surrounding tissue the general surgeon should call the dental surgeon into consultation. He is in favor of simple rubber splints in most cases, with the exception of those few in which the steady maintenance of fragments is indicated, and he objects altogether to maxillary wiring, as this creates a risk of ankylosis being set up. If pressure from the outside is necessary, he employs linen bandages or special chin-cups of rubber or metal with hoops fastened together from the attachment of elastic bands that will allow pressure in the direction indicated by the case. He believes that a good meth-



od of procuring hygiene of wounds in the oral cavity is to suspend a receptacle, fitted with a rubber tube and glass cannula, above the head of the patient; to fill it with a light tepid solution of from 5 to 10 per cent iodine or chloride of sodium, and to wash out the cavity thoroughly from three to six times a day, according to the septic condition present.

COLYER follows with a brief description of the results of his experience in connection with the Croydon War Hospital. There are one or two main points in connection with the treatment in this hospital of which he speaks: As soon as the patient is admitted to the hospital, a peroxide mouth wash is given every two or three hours, and a 2 per cent solution of iodine is applied once every day. Skiagrams are obtained and short notes made; the patient is then taken to the operating theater and given a general anæsthetic, usually chloroform, when attempts are made to reduce the various fractures. Septic roots are removed, as well as the teeth on either side of the fracture. This is a universal rule throughout the hospital. The next step consists of the adaptation of splints, the fixation of which is generally left for two or three days, or until there is a certainty that all sources of sepsis have been removed. When the patient is practically convalescent and the fracture is completely healed, a retention splint is inserted; also before going back to the front, these soldiers are put through a dietetic course. Before they leave the hospital, they are changed from a liquid diet to a minced one, then to a boiled diet, and lastly to a roast diet.

Colyer believes that the most important displacements in the treatment of jaw cases are those that occur when there is a fracture in the region of the last molar tooth; very often there is involved a loss of tissue to the extent of one-half to three-quarters of an inch. The splints he uses are very simple; one to which he refers especially is known as the skull and mandible splint, consisting of a metallic splint moulded to the outside of the mandible in a knitted skullcap. Ununited fractures are usually due to the presence of a foreign body between the fragments, and, secondly, to a lack of rest, the foreign body usually being a tooth. Sinuses in connection with fractures of the jaw are, in a majority of cases, due to septic teeth. Scar tissue is cut away freely from the jaw, and forcible stretching of the soft tissue by means of plugs of vulcanite is adopted. "Stiff jaw," in which the scars have to be stretched, is treated by using continuous stretching over a definite period. He has done bone-grafting in two cases, both successfully.

SIR FREDERICK EVE believes that the ideal method of bridging over gaps in the mandible is transplantation of bone. This operation is rendered very much easier if splints are firmly cemented to the teeth across the gap. He has transplanted a portion of the eleventh rib. He has not as yet seen a case in which plating in gunshot fractures of the mandible seemed advisable.

HERNE states that the treatment may be divided

into two main stages: (1) the correction of displacements and support of fragments while the healing of soft tissue and bony union is taking place; (2) the fitting of some prosthetic apparatus for the replacing of lost parts; restoration of the function of mastication—possibly also of speech—and reduction of disfigurements. The interval between these two stages should be devoted by the patient to the stretching of the scar tissue and the massage of any cicatricial bands that may have formed during the healing of the soft tissue. He believes it important that splints be simple and aseptic in design, and applied in a manner which will avoid the damming of discharges.

MUMMERY refers only to the methods dealing with missing portions of the mandible where large or smaller portions of the arch have been destroyed, leaving a gap in its continuity. Where large portions of bone are missing, artificial restoration, he believes, is the only course possible in the majority of instances; where a portion extending one-half or three-quarters of an inch are missing, he believes that osseous union will take place in the great majority of cases. He does not believe in the old method of bringing the fractured ends together by wiring them, although he realizes that it requires a longer period of time to obtain a firm bony union across the gap than it does when the ends of the fragments are in contact.

NORTHCROFT endorses Hayes' view as to plastic operations being performed without consultation with the dental surgeon. He presents the photograph of one patient who had his right maxilla fractured, and the mandible in four places, with loss of substance on the right, and no remaining tooth in the posterior fragment; the occlusion being maintained here by intermaxillary attraction, until such time as phlanged dentures can be inserted with a reasonable prospect of success. He has also designed a temporary cap splint which is uncemented, has the front cut away, is easily removable, being ligatured to three or four teeth, round loops on the lingual side, and round vertical wires on the buccal side.

BENNET says that his experience does not lead him to subscribe to the views of Colyer that the chief thing to seek is bony union even if there should result some lack of normal occlusion. In regard to apparatus, he is in favor of removable rather than fixed splints.

COLE also dissents from the views held by Colyer on the question of occlusion versus union and believes, as does Hayes, that the presence or absence of a single tooth on a fractured portion may suffice to change the method of treatment entirely; and further, he believes that conservation of one or two particular teeth will render relatively easy what would otherwise be a task beset with difficulties. So strongly is he convinced of this, that he has had root treatment carried out on the operating table. He believes, most emphatically, that early reduction and retention of fragments in jaw injuries are effectual



means of combatting sepsis, and add materially to the comfort and well-being of the patient. He also thinks that the dental surgeon should be a skilled technician; that he should be willing to make his services subserve the immediate, and anticipate the ultimate requirements of the surgeon; and he believes that the surgeon should have a working knowledge of the range and extent of the dental surgeon's possibilities, and that he should know and make known his requirements.

BENNETT believes that in all cases of surgical work on the jaw care should be taken to preserve every tooth that is taken out, so that, in peace times, they may be examined carefully.

JAMES has found that where there is contraction of scar tissue, pressure can be obtained from a length of rubber tubing introduced into the mouth in such a manner as to bring pressure upon the contracted tissue; quite thin tubing is used at first, and the heavier rubber introduced later. Pressure is obtained by an arrangement of the tube in a U-form, and it may be increased by tying the two free ends together to form an oval.

PEARCE agrees with Payne, and emphasizes the four points with which the latter concludes. He regrets that the authorities have allowed these cases to go six or eight months before referring them to the dental surgeon.

TURNER finds that Dakin's solution is extremely useful in these cases of sepsis. He agrees with the other speakers in the use of cemented splints, especially where there is a possibility of having to remove them in order to extract a root. Regarding the loss of bone, he agrees with Mummery. He thinks that all metals used in bone repair are apt to work loose subsequently. Where the cicatrix is once stretched, a return may be prevented by the exertion of a small amount of force, applied daily.

CARTER believes that wire suturing of the jaw causes fixation at once, and is followed quickly by osseous union. He is in favor of silver-plated copper wire (No. 19-BWG), and a special key for twisting it up, as well as a flexible needle for returning the wire. The drill must not be revolved too rapidly or advance too quickly, or necrosis will be caused by heating. A small rubber tube to protect the lips is put over the twisted ends of the wire before being turned down, or a thin strip of rubber dam may be wound round them and the two ends tied.

EMIL C. ROBITSHEK.

**Rico, I.: Calculus of Wharton's Duct** (Calculus del canal de Wharton). *Rep. de med. y cir.*, Bogota, 1916, vii, 343.

Calculus of Wharton's duct is of relatively rare occurrence. The author reports a case in a man of 50. Thirty years previous he had had acute pain in the left submaxillary gland followed by inflammation. Recently the pain reappeared in this region accompanied by fever, etc., followed by genuine salivary colic and abundant discharge of saliva and pus.

By palpation a hard mass was located in the direction of Wharton's duct, and the diagnosis of a calculus was verified by passing a sound. The patient would not permit an incision to be made. Later on the calculus perforated the mucous lining and appeared in the mouth. The symptoms rapidly disappeared.

W. A. BRENNAN.

**Guibé: Cranial Wounds in War Surgery** (Considérations sur les plaies du crâne en chirurgie de guerre). *Presse méd.*, 1916, p. 205.

In fifteen months Guibé has observed 37 cranial injuries of which 23 have been trephined. In the other 14 cases intervention was useless. They all died within 12 hours of their arrival.

As regards the evolution of such injuries Guibé emphasizes the frequency of cerebral hernia after intervention for penetrating wounds with dura mater injury; also the frequency of encephalitis and the rarity of meningitis.

Non-penetrating wounds in general heal; penetrating wounds, on the contrary, are almost always fatal. Frontal region injuries are generally more benign than parietal.

Early intervention is necessary. If there is no functional trouble and no evidence of a lesion of the dura mater it is better to abstain from opening it. To prevent cerebral hernia recourse should be had to repeated lumbar punctures; but it is even better to make an early and sufficiently large trephination.

W. A. BRENNAN.

**Schmidt, P.: Pneumococcic and Meningococcic Meningitis After Fracture of Base of Skull** (Pneumokokken und meningokokken Meningitis nach Schädeldbasisfraktur). *Deutsche med. Wchnschr.*, 1916, xlii, 124.

Schmidt reports an interesting case of meningitis with double infection by pneumococci and meningococci. The patient, a workman, had suffered a fracture of the base of the skull, and was removed to the hospital seven days afterward. He died the next day. Bacteriologic examination of the spinal fluid made on the date of his entrance to the hospital showed pneumococci and meningococci in approximately equal quantities. The blood examination showed only pneumococci.

Autopsy showed a fracture of the upper part of the sphenoid and ethmoid fissure. The dura mater was not injured. Blood-clots and mucus were found in the sphenoidal sinus; the mucosa of the superior nasal cavity was tumefied and inflamed. There was no inflammatory process in connection with the ethmoid and sphenoid. The lungs showed on both inferior lobes bronchopneumonic multiple foci of three or four days' formation.

That the infection of the meninges in this case was direct from the inflamed upper parts of the nasal cavity either through the ethmoid fissure or that of the sphenoid and therefore by the lymphatics and not by the blood seems to the author not to need demonstration. If the infection had been



through the blood it would be natural to expect that this would have shown the presence of meningococci as well as pneumococci. W. A. BRENNAN.

**Kanoky, J. P.: Thyroid Tumors of Bones, with Special Reference to Non-malignant, Pulsating Tumors of the Skull.** *Surg., Gynec. & Obst.*, 1916, xxii, 679.

The author reviews the literature on thyroid tumors found in bones and gives a brief résumé of cases thus far reported. He describes in detail a case coming under his own observation. As a result of his study he concludes:

1. That from the literature the majority of investigators conclude that primarily all metastatic thyroid tumors are histologically benign.

2. That metastatic tumors could result from small particles of thyroid tissue which have found their way into the circulatory apparatus.

3. That in many cases of thyroid metastasis there is no hypertrophy of the glands or apparent pathological condition.

4. That the malignant character of some of these tumors is due to some secondary influence, possibly engendered by the thyroid cell acting as a foci of continued irritation.

5. That the deposition of embryonic thyroid cells is tenable, and may be the greatest factor in the production of thyroid metastases, but the growth of such cell outside of its direct environment is made possible by some peculiar systemic condition as yet unknown.

**Leopold, S.: Circumscribed Purulent Leptomenigitis Due to Frontal Sinusitis.** *J. Am. M. Ass.*, 1916, lxvi, 1676.

Two cases are reported. These cases, as well as a study of the literature, show that the symptoms are frequently preceded by weeks or even months of nasal catarrh, with frontal headache, or they may occur after only a few days, following an attack of influenza. Edema and discoloration of the eyelid, with tenderness over the orbit, frequently precede the cerebral symptoms when disease of the wall of the sinus or orbit is present. Frontal headache is present in nearly all cases, though pain in the head is not limited to that region. The pulse and temperature are not characteristic. Rigidity of the neck and Kernig's sign, though noted in both the cases reported, are not frequent symptoms. Paralytic symptoms are noted usually in a later stage of the disease. Irritability and restlessness, alternating with clouding of the sensorium, are sometimes the only meningitic symptoms present, and death sometimes comes before the development of paralytic symptoms. The pure meningitis following frontal sinus disease is less frequent than brain abscess, but much more frequent than thrombophlebitis.

The explanation of this phenomenon depends on the route of infection which may be direct, through the interstices or necrotic walls, or indirect, through

the venae perforantes of the sinus and orbit or through the lymphatics.

It seems that in many cases the dura escapes involvement, that incision is necessary in all cases in which absence of lesions on the surface is noted. This holds true, not only for the meningitic cases, but also for the subdural and frontal lobe abscesses.

EDWARD L. CORNELL.

**Hartmann, H.: Cranial and Craniocerebral Wounds** (Plaies crâniennes et cranio-cérébrales). *Bull. et mém. Soc. de chir. de Par.*, 1916, lxii, 1263.

Hartmann's observations are based on 152 cases reported by different operators. Of the injuries 60 per cent were in the parietotemporal region; 22 per cent in the frontal region; 18 per cent in the occipital region. In 130 cases there was a complete fracture of the skull and in 85 of these the dura mater was involved.

The prognosis of cranial injuries by gunshot is grave and varies not only with the intensity but also with the site of the lesion, temporal lesions being the most severe, parietal, frontal, and occipital following in severity in the order named. The last gives 100 per cent recovery. W. A. BRENNAN.

**Villaret, M., and Faure-Beaulieu: The Grave Accidents of Late Appearance in Craniocerebral Wounds of War** (Les accidents graves d'apparition tardive chez les blessés de guerre craniocérébraux). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1916, xxxii, 535.

The authors give particulars of 27 cases of cranial wounds out of a total of 256 which have presented grave accidents appearing several months after the traumas. These cases are classified under four headings: (1) late epilepsy, (2) grave mental troubles, (3) meningeal infection and abscess of the brain, (4) late brain hernia.

Mental troubles and late cerebral hernia are exceptional. The most frequent and important results are late epilepsy and suppurative meningo-encephalitis. Meningitis and suppurative encephalitis were noted in four cases appearing from two to eight months after the traumas. The study of these cases has shown the important part played by the persistence of foreign bodies and metallic débris in the lesion. In the case of late epilepsy it is most interesting from the point of view of the lapse of time after the trauma. In one case this extended to thirteen months, but most often it oscillates between four and ten months.

Most of these cases have been trephined for the primitive injury.

The practical conclusions which the authors draw from their study of the cases are that in the case of men trephined or presenting traces of craniocerebral traumas, the future prognosis must be reserved even in the absence of flagrant symptoms of central nervous lesions. Systematic radiologic examination of the cranium should always be made to discover metallic débris or osseous particles;



these are foci which provoke late grave results. Such men should not be returned to the front but kept at duty in the rear under medical supervision.

W. A. BRENNAN.

**Sharpe, W.: Observations on the Diagnosis and Treatment of Brain Injuries in Adults.** *J. Am. M. Ass.*, 1916, lxxvi, 1536.

The author believes that the mortality of brain injuries in adults has heretofore been high (46 to 68 per cent in all cases), because patients have been allowed to reach the dangerous stage of medullary compression. The signs and symptoms giving warning of increased intracranial pressure and resulting medullary compression are carefully discussed and the importance and value of frequent observation regarding pulse, optic discs, intraspinal pressure, and the presence of blood as noted by lumbar puncture, repeated if necessary, are pointed out.

In a series of recent brain injuries, chiefly fractures of the skull, operation was performed on 79 with only 14 deaths. Operation in the presence of shock with a pulse-rate of over 120 is absolutely contraindicated.

While valuable for diagnosis, lumbar puncture should not be used for the purpose of lowering high intracranial pressure for fear of medullary choking in the foramen magnum.

X-rays are of little importance in the treatment of fractures of the skull.

As regards late results of untreated fractures of the vault or base, the author looked up a series of cases and found 67 per cent were still suffering from the effects of the injury.

The common complaint was headache on exertion. Other symptoms were vertigo, irritability, and epileptiform spells, the patients often being disqualified for employment. Of these cases 74 per cent had had a pulse-rate below 70 following injury.

The author believes the late results are due to an increase of intracranial pressure for a long period. Treatment in the majority of cases with increased intracranial pressure should be early decompression; all compressed fractures of the vault should be elevated or removed for fear of later complications. Palliative treatment may assist in bringing about recovery in milder cases but the large proportion require operative relief of the increased intracranial pressure due to hæmorrhage or to the increase in amount of cerebrospinal fluid sufficient to produce a wet, oedematous, swollen brain.

In post-traumatic conditions due to long increase of intracranial pressure a large percentage can be improved by operation. The operation of choice in both selected acute and chronic cases of brain injury is subtemporal decompression. The author recommends a straight vertical incision from zygoma to parietal crest and longitudinal splitting of the fibers of the temporal muscle. This gives better hæmostasis and union of the divided muscle.

HORACE BINNEY.

**Grey, E. G.: Studies on the Localization of Cerebellar Tumors; the Pointing Reaction and the Caloric Test.** *Am. J. M. Sc.*, 1916, cli, 693.

The records of 31 cases of cerebellar and extracerebellar tumor are discussed relative to the importance of the pointing reaction (Barany) and of the caloric test.

The situation of the growths in the 31 cases was as follows: 3 in the vermis, 10 in one hemisphere, 5 involving the entire cerebellum, 8 cerebellopontine, and 1 extracerebellar.

Grey concludes that the caloric test has proved to be an important means of differentiating labyrinthine from intracranial disease. Together with the pointing reaction, this test has been found of value in localizing circumscribed lesions in the cerebellum.

In most patients having tumors in the cerebellopontine region, new-growths, and in certain of those with tumors of one or the other hemisphere, the reactions were sufficiently characteristic to be of supplementary value in localizing the disease. In other patients with intra- or extracerebellar tumors, the results were often ambiguous, at variance with other physical findings and, had great reliance been placed upon them, would have led to erroneous conclusions.

There are probably a number of factors responsible for an atypical reaction in patients with cerebellar tumors, among which are (1) greatly increased intracranial pressure, due to internal hydrocephalus, and (2) the diffuse nature of many of the tumors common to the cerebellum.

D. L. DESPARD.

**Livierato, Spiro, and Cosmettatos, G. F.: Tumors of the Hypothalamic Region of the Middle Brain** (Sui tumori della regione ipotalamica del cervello intermedio). *Riforma med.*, 1916, xxxii, 449.

Tumors of the hypothalamus of the brain comprise those which develop in the mamillary, hypophyseary, and chiasmatic regions. Their development and the consequent compression not only provokes destruction of one of the regions mentioned but also of the nerves which traverse the base of the cranium in the neighborhood of the hypothalamic region and thus produce multiple cerebral phenomena. The symptomatology varies according to the point primarily attacked and the more or less rapid progress of the tumor.

The authors report in detail a case of psammoma of the hypothalamic in a woman of 37. In addition to general and nervous symptoms, the patient showed marked special sensory symptoms. There was complete loss of smell on both sides, also atrophy of the papilla of the optic nerve both left and right, followed later by amblyopia of the left eye with persistent, intense pain. A cerebral tumor was diagnosed and a trepanation done in the right temporal region, but nothing of importance was discovered. The woman died in coma six days after the operation. The tumor was demonstrated at autopsy.



In reviewing the literature concerning the frequency of tumors of the perichiasmatic region the authors find that in the case of tumors developed in the meninges, into which category their own case falls, only three such cases have been reported. They state that the case reported by Heinrichsdorf, and their own case constitute a special category, i.e., that of psammomata of the prechiasmatic region, and that these two cases are the first reported up to the present time.

From the anatomoclinical study of their own and other cases the authors find that the monolateral involvement of the optic nerve first observed and accompanied by anosmia fixed the location of the tumor at the anterior angle of the chiasma. This anosmia which is due to a destructive compression of the perforated anterior substance or of the olfactory nerve has a great diagnostic value, particularly when no other nerve besides the optic is involved. The compression or destruction causes degeneration of the nerves of Lancisi which unite the peripheric and central olfactory apparatus.

The authors claim that circumhypophysary tumors may develop and attain great size without the hypophysis itself being clearly attacked or disturbed in its functions.

W. A. BRENNAN.

**Castex, M., and Costa, S.: Adenocarcinoma of the Cerebellum** (Adenocarcinoma del cerebello). *Prensa. méd.*, Argent., 1916, No. 30, 361.

The author describes the case of a man 32 years old, who had been ill for six months with violent and continuous headaches, localized in the anterior part and right side of the head. He vomited without initial nausea and without the ingestion of food; at times, nausea was so intense as to interfere with his standing or walking, and he had manifestations of falling on the left side. The patient was constipated. Reflexes, pulse, Romberg, lungs, pupils, etc., were all normal. The urine and blood were negative. Lumbar puncture gave out a liquid with a normal tension, and flowing drop by drop; clear; Apelt's and albumin reactions present; Wassermann negative; lymphocytic sediment.

The patient received biocyanide of mercury (0.01 to 0.02 cg.) daily, intravenously, and 4 to 6 gm. of KI, daily. The symptoms diminished in intensity for the first week. From the fifteenth day, however, the symptoms increased to such an extent that the patient could not move from his bed; his eyes were closed and he moaned continuously. The cephalalgia became so extreme that the patient would take his head between his hands and scream in agony. The headache was no longer frontal, exclusively, but occipital as well. The position he would assume in preference was a right lateral decubitus, and pain was evident upon muscular pressure. Babinski's sign was present on both sides. Deep and muscular sensations were present. The pupils reacted well, but were found to be unequal. There was left facial paresis in the region of the superior and inferior facial. There was bradyla-

lia and a depressed intellect. After another lumbar puncture, which showed no tubercle bacilli, nor a positive Wassermann; 90 per cent lymphocytes and 10 per cent polynuclears, the patient entered a state of continuous excitement and was unamenable to morphine treatment given in repeated doses. The symptoms continued unabated until a comatose condition ensued and death occurred several hours thereafter, or about 11 months from the onset of the disease.

As to the diagnosis, there were two possibilities: a tumor of the right frontal lobe, with cerebellar symptoms due to counterpressure; and a cerebellar tumor in the right hemisphere. An autopsy furnished the following findings: Dura tense and hyperæmic; cerebrum markedly congested. A macroscopic examination of the cerebellum showed that the entire right lobe and the isthmus were of a gelatinous consistency. The border or the posterior margin of the right hemisphere presented a stratification of the circumvolutions, much less than in the left, without an involvement of the meninges. A horizontal incision was made, passing through the center of both cerebellar hemispheres and comprising the median cerebellar peduncles, also the dentate nucleus. Interesting changes were observed. An enormous mass occupied the posterior third of the right hemisphere, and from it flowed a substance of an albuminous consistency, of a yellow-pinkish color, leaving behind a series of cavities, few in number and of various sizes. The mass was of a heterogenous aspect, some parts compact, others spongy; some hard, others soft, of a mixed color, with definite borders in some parts and diffuse in others, infiltrating the nervous tissue in some parts, compressing and covering it entirely in others. Vascularity, rich. Certain zones were easily enucleated, while the greatest portion of the mass was infiltrated and could not be enucleated. The anterior posterior diameter of the mass was 3 cm., transverse diameter 4 cm., vertical diameter 3 cm. The shape was more or less spherical. Its anterior part was not smooth. The cortical substance of the circumvolutions was not invaded; it was found compressed and crushed, but not attached to the tumor.

A histologic study of the tumor showed it to be a tumor of a carcinomatous type with cylindrical cells, of the form known as adenocarcinoma. The neoplastic cells showed extreme proliferation. Apparently there was no relation of contiguity or continuity between the carcinoma and the fourth ventricle, whence epithelial plexus could have originated. The cylindrical type of the adenocarcinomatous cells have probably a direct or indirect relation to the ventricular ependyma.

RAOUL L. VIORAN.

#### NECK

**Geist, G. A.: Congenital Cysts and Fistulæ of the Neck.** *St. Paul M. J.*, 1916, xviii, 157.

The author insists that congenital cysts and fistulæ of the neck must be divided into two groups,



according to the embryologic origin of each: (1) median and (2) lateral cysts and fistulæ. He then takes up the subject of median cysts and fistulæ and gives the theories of their origin as outlined by the works of Streckeisen and His.

The views of Wengowski, as published in 1912, are quoted. The site of the opening depends greatly upon the size of the cyst, and upon the attachment of the cyst wall to the skin, due to inflammatory processes. Cysts are usually irregular in shape, projecting into the connective tissue, and, if ruptured, the resultant fistula is tortuous, making the passage of a probe difficult. Injection of colored or flavored liquids to determine, if possible, the communication with the foramen cæcum, is usually futile, unless pathological rupture into the mouth has occurred.

A patient, aged 21 years, presented a subhyoid, median, fistulous opening. Diagnosis was made after an injection of bismuth paste, and X-ray. Total extirpation of the walls of the cyst was performed, with good results.

Lateral fistulæ are classified as complete and incomplete, and the latter divided into incomplete internal and incomplete external fistulæ. The complete occurs in the young or is present at birth, but the cyst formation occurs in later life. Fistulæ are found more frequently on the right side and are rarely bilateral; the external openings are usually single. The secretion is a mucous fluid, clear or turbid, the amount varying from a few drops to an almost continuous flow.

The caliber of the canal is so small that the finest probe is passed with difficulty, or so large as to allow the passage of food particles from the pharynx. Injection of fluid will establish a diagnosis of complete or incomplete fistula. The diagnosis of lateral cysts is not so easy as in the case of fistula.

Geist believes there are two methods in the treatment of cysts and fistulæ of the neck: (1) injection of irritant drugs into the fistula or cyst; (2) total extirpation of the cyst or fistula wall, the latter being the better.

Two cases are reported. One case was a girl of eight years who presented two small openings midway between the chin and the clavicle, over the sternocleidomastoid muscle of the right side. The other was that of a woman of thirty years who presented a vertical scar two inches in length in the middle of the border of the sternocleidomastoid muscle, and, in the lower end of the scar, a small, pin-point opening was present. Both were operated upon with good results. EMIL C. ROBITSHEK.

**Begouin: Results in Seventeen Cases of Neck Resection in the Secondary Period of Traumatic Arthritis** (Résultats de dix-sept cas de resection du coude dans la periode secondaire de l'arthrite traumatique). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 802.

Begouin points out that the enthusiasm of Leriche and other partisans for immediate or very

early resection of the neck in cases of arthritis should be tempered and that the advice of Quénu should be followed who urges that there be further observations before coming to a definite conclusion in the matter.

Begouin gives the results of 17 cases of resection of the neck in cases of arthritis caused by projectiles in which operations have been performed by different surgeons and in which Begouin has had the opportunity of judging the end-results, which are quite deplorable. Of the 17 cases the neck is unbalanced in 15 and the forearm is inert even after effort; in the other two the arm is somewhat better but still the patients cannot raise anything to their mouths, nor button their clothes.

Begouin thinks that the good results reported have occurred in the case of surgeons who were specially familiar with this resection and were able to devote sufficient time for personal supervision of the after-treatment which is most important.

In the hands of the average surgeon, he thinks the results will not be better than those reported; and he is of the opinion that interference by resection in the secondary period will not give as good results as would be obtained by allowing an ankylosis to be established in good position. Large arthrotomy incisions, lavage of oxygenated water, curettage, etc., should be the treatment which will either effect a recovery or leave an ankylosis.

HARTMANN, QUÉNU, and BROCA discussed the paper, and the general opinions expressed seemed to favor Begouin's views with certain reservations.

W. A. BRENNAN.

**Bell, A. J.: Prolonged Use of Tubes Following Diphtheria.** *Arch. Pediatrics*, 1916, xxxiii, 161.

The patient, aged one year, was suffering from laryngeal diphtheria, with a history of having been sick about two weeks. The child was decidedly toxic, temperature 103.2°, pulse 140 or more, and the respirations of the Cheyne-Stokes type. There was marked retraction of the chest wall upon inspiration. No membrane was visible upon the tonsils or pharynx. A dose of 20,000 units of antitoxin was injected into a vein and 5,000 into the thigh. The respiratory failure was due to the general toxæmia. On attempting intubation, the patient ceased to breathe and went into profound collapse. The pulse could not be felt nor the heart sounds heard and for several minutes the child appeared to be dead.

A low tracheotomy was done, artificial respiration performed, and stimulants given. The patient finally began to breathe, at first with only mechanical gasps, due to the manipulations, and then by the return of the pulse. After breathing began, sufficient air entered the lungs, but a most distressing cough kept up for half an hour or so. This was immediately relieved by allowing two or three drops of a 2 per cent cocaine solution to run down the tube. Steam inhalations and tent were used from the start. For several days rectal feeding was resorted to because of the tendency to choke. On the fifth day a very slight amount of air entered

through the larynx when the opening of the tube was closed. On the seventh day the tube was removed for fifteen minutes. Although some air entered through the normal passage, nearly all the breathing was through the opening in the neck.

On the ninth day 20,000 units of antitoxin was given on account of the large oedematous swelling of the fauces, which mechanically interfered with feeding. This condition improved the following day. Between the ninth and the twenty-first day there was no change in the tube situation. On the twenty-eighth day, the child's temperature was normal for the first time. On the twenty-ninth day the patient's general condition was excellent. The finger was placed over the opening of the tube and a sudden pressure applied to the chest wall with the result that the child uttered a distinct cry and

coughed several times. This was successfully repeated every few minutes for half an hour. On the thirty-first day, the tracheotomy tube was removed permanently and the child had no further difficulty in breathing through the larynx.

Without warning or physical signs to account for it, two days later the child developed a subnormal temperature and typical Cheyne-Stokes breathing. On the thirty-fifth day, 20,000 units more of antitoxin (making in all 65,000 units) was given. At this time the throat cultures were still positive. After this further progress was uninterrupted. There were no paralyses of any kind; phonation was normal; and the child was discharged in excellent condition, after having been in the hospital for two months.

EDWARD L. CORNELL.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Durante, L., and MacCarty, W. C.: Tuberculosis of the Breast.** *Ann. Surg.*, Phila., 1916, lxiii, 668.

The authors have observed 10 cases of tuberculosis of the breast. In 3 of them no primary focus was clinically demonstrable; in 3 no clinical tuberculous lesion except the axillary lymphatic involvement was demonstrable; in 1 there was an associated pleurocostal lesion; and in 3 there were evidences of pulmonary tuberculosis.

From a review of the literature, the following seem to be the important points in the disease:

1. The period of greatest susceptibility is between the twentieth and fortieth years. A total of 180 cases have been reported.

2. Although there is no apparent relation between the two diseases, 17 cases have been reported in association with neoplastic processes.

3. Practically every case is secondary to a primary focus elsewhere in the body, although infection by way of an abrasion in the skin is possible.

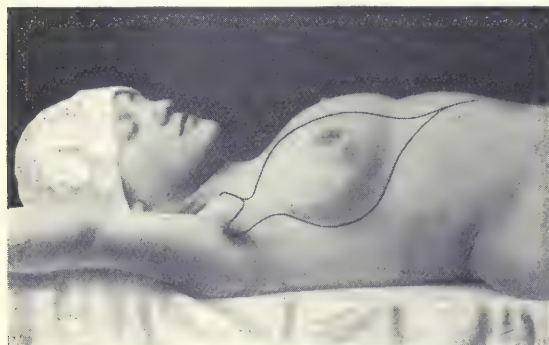


Fig. 1. Showing the line of incision. (Jennings.)

4. Most observers have considered the blood stream to be the most common route of infection, though in certain cases the organisms were apparently carried reversely from the neighboring lymphatic glands.

5. A microscopic diagnosis is essential in practically all cases, although other means, such as cultures, smears, and guinea-pig injections should not be overlooked.

GATEWOOD.

**Jennings, J. E.: Cancer of the Breast.** *N. Y. M. J.*, 1916, cii, 980.

The author emphasizes the necessity of early diagnosis and operation and points out that 76 per cent of breast tumors in women over thirty years of age are malignant. In cases under that age, less than 10 per cent are malignant.

The examination of the breast should be thorough; cancer is more common in the upper quadrant, under the nipple, and on the outer side. Benign neoplasms occur more frequently in the inner quadrant. Flattening, retraction of the nipple, or shortening of the radial axis is suggestive of carcinoma, especially scirrhus, which causes contraction of the suspensory ligaments of the breast, elevating the affected nipple an inch or more. In later cases when the skin itself is infiltrated, difference in color may be seen, or the orange or pig-skin pitting will make its appearance, or chronic eczema with discharge from the nipple.

If the clinical diagnosis is not conclusive, the breast should be explored and the diagnosis made from the gross examination or from frozen sections.

The essentials of a radical removal of the breast is a wide skin incision with a wider removal of the deep fascia, the pectoralis major, minor, axillary fat, and lymphatics. The fascial removal should reach below the ensiform and the epigastric triangle of Handley. The supraclavicular glands should be





Fig. 2. After the breast has been removed. (Jennings.)



Fig. 3. Showing suture line. (Jennings.)

removed when the growth is in the upper or inner part of breast.

Illustrations show the incisions that Jennings has found useful.

D. L. DESPARD.

**Lenormant, C.: Some Observations Regarding the Removal of Projectiles by Thoracotomy** (Quelques observations de projectiles enlevés par thoracotomie). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 570.

The author reports 8 cases of removal of intrathoracic projectiles by thoracotomy, and the particular point to which he draws attention is the advantage of large pleural openings. He thinks the procedure of choice is the resection of a single rib for a distance of 10 or 12 cm. This can be done bloodlessly in a few minutes and without any ligature being necessary later.

It gives ample opportunity to palpate and examine the thoracic cavity, to expose a pulmonary lobe if necessary, to approach the mediastinum and to raise and incise the diaphragm.

After operation a few sutures of the soft parts of the intercostal spaces will hermetically close the thoracic breach.

The large opening of the pleura has never been the cause of any accidents in the author's practice. For a long time he insisted on the harmlessness of operatory pneumothorax, and he thinks that recent experience in intrathoracic surgery has confirmed this opinion. The fear of opening the pleura should be dismissed from the surgeon's mind. Under a rigorous asepsis the operations can be done in the thorax just as in the abdomen.

The majority of Lenormant's patients have had a total pneumothorax. None has shown the least respiratory or circulatory incident. If there should be some irregularity of respiratory movements on the entrance of the air traction of the lung will restore order.

In this procedure no drainage is indicated. Resorption of intrapleural air is so rapid that he has not found it necessary to aspirate it.

The cases reported by Lenormant comprise 3 intrapulmonary foreign bodies, and 2 foreign bodies

of the mediastinum, one in front of the posterior part of the sides, the other being situated behind the pericardium, at the depth of 13 cms.

A sixth case is that of a projectile included in the thickness of the diaphragm. In a patient recently operated upon Lenormant has extracted by transpleural and transdiaphragmatic laparotomy a bullet situated in the convex face of the liver.

W. A. BRENNAN.

**Burk: Extraction of a Piece of Grenade from the Pleural Cavity by Means of the Electromagnet** (Extraction eines Granatsplitters aus der pleura Höhle mittels des Elektromagneten). *Deutsche med. Wchnschr.*, 1916, xlii, 134.

The question as to which should be preferred, the operatory method or the use of the electromagnet, for the extraction of portions of projectiles retained in wounds or in cavities does not admit of discussion. The operatory method is in the majority of cases the most secure, the easiest, and the least dangerous. In the trachea, the œsophagus, and intrathoracic regions, however, in which operation is difficult or impossible, extraction of the foreign body must be made generally by means of the electromagnet.

The case reported by Burk was that of a soldier, who in addition to a gunshot wound had two punctured wounds about the level of the tenth right costal. In the right thorax about the level of the middle of the scapula, there was a very pronounced cutaneous emphysema. In the pleural cavity there was evident wheezing which extended to the angle of the scapula. Exploratory puncture was bloody. Resection of the tenth costal released about 500 ccm. of a foetid, purulent, bloody liquid with little particles of projectile. On recovery from this operation the patient was sent to a base hospital where it was found that the right lung was greatly collapsed and that the pleural wound gave a very foul secretion containing pyocyanus micrococci. By means of a sound a fragment of projectile could be felt in the pulmonary pleura about 10 cm. from the operatory wound. The rigidity of the thoracic wall did not favor extraction of the

projectile by the ordinary operative method; moreover the patient's condition did not warrant further operative damage to the lung. The author therefore determined to endeavor to withdraw the fragment with the electromagnet. After some fruitless attempts he succeeded in extracting the fragment which was about 1.5 by 2 cm. in size. A few days after the extraction the suppuration ceased and within a few weeks there was a gradual extension of the collapsed lung. The patient improved and gained 22 lb. in weight though there was still some mastitis.

W. A. BRENNAN.

### TRACHEA AND LUNGS

**Green, N. W., and LeWald, L. T.: Foreign Bodies in the Respiratory Tract.** *Ann. Surg.*, Phila., 1916, lxxiii, 656.

Although Hippocrates inaugurated intubation of the larynx in order to relieve suffocation, very little of note in the treatment of foreign bodies in the bronchi was brought forward prior to the work of Killian in 1896. Since that time many laryngologists and surgeons have interested themselves in this pathological entity with the result that remarkable strides have been made both in diagnosis and treatment.

In the laryngeal portion of the respiratory tract the vocal cords constrict the lumen. In the ventricle of the larynx, objects frequently find lodgement. The next stopping place is at the level of the cricoid. The bifurcation of the trachea rarely arrests an object, as bodies small enough to pass the cords will slip into a bronchus. The right bronchus, from its size and position, is the one most frequently entered. The next point of arrest is in the epiarterial bronchus on the right or the hyparterial bronchus on the left or in the "trunk" bronchus on either side. A small body may penetrate the divisions of the "trunk" bronchus into the various lobe bronchi and their subdivisions.

Foreign bodies may be classified as mineral, metal, or organic. Most mineral and metal objects are revealed by the X-ray. Some organic materials, such as pieces of bone, can be detected in the same way. The most dreaded objects, however, are the organic substances, such as seeds and beans, which cast no shadow and which swell rapidly.

According to Bruenings, 69 per cent of foreign bodies occur in children less than twelve years of age. The greatest frequency is at about two years of age.

All recently aspirated foreign bodies should first be sought by the X-ray and the bronchoscope, without delay, and removed if possible through the mouth. Should this attempt fail, a tracheotomy should be done or another effort made by means of the bronchoscope. Failing in this also, the wound should be held wide open by wires or by a large tube in the hope that the foreign body may be coughed out. If all attempts at immediate removal

fail, a period usually elapses during which the patient may develop secondary changes in the lung, such as pneumonia, gangrene, abscess, and generally an overlying empyema. If he recovers from these acute infections, he passes into the class of deferred cases, and removal of the foreign body in these deferred cases does not always effect a cure. The lung abscesses must be treated along surgical lines, and even then it is not always possible to effect a cure, but only an amelioration of the affliction.

GATEWOOD.

**Canuyt, G.: War Injuries of the Larynx and Trachea** (Les blessures de guerre du larynx et de la trachée). *J. de méd. de Bordeaux*, 1916, lxxvii, 93.

Injuries of the larynx are comparatively rare in war. The statistics of military surgery of former wars show about 6 laryngeal for 10,000 wounds of other organs. In the present war Delorme has stated that wounds of the neck comprise about 3 per cent of all wounds and that wounds of the larynx and trachea are very rare. Guisez found in 720 wounds of the head and neck, 17 laryngeal and 2 tracheal. The larynx on account of its great mobility is able to protect itself from a projectile, but in case it is injured the man may die suddenly.

The most important class of injuries referred to by the author are penetrating wounds of the larynx, which have for after-effect a traumatic stenosis, either circular or tubular. The treatment of these laryngostenoses consists either in tracheostomy, laryngostomy, tracheolaryngostomy, or progressive dilatation. In the latter case after the first intervention and insertion of the cannula, the cavity is left open. This cavity is packed above the cannula with iodoform gauze by means of a dressing. The dressing is replaced at the end of fifteen days or three weeks by a caoutchouc tube, the caliber of which is progressively changed. This is open caoutchouc tube progressive dilatation. When the dilatation is judged to be sufficient, say at the end of five or six months for circular stenoses, twelve to fifteen months for tubular, the caoutchouc tube is suppressed and a tracheolaryngeal plastic operation is done which constitutes the last phase of the treatment.

W. A. BRENNAN.

**Silvestrini, L.: Phrenicotomy in the Treatment of Some Chronic Diseases of the Lung** (La frenicotomia nella terapia di alcune malattie croniche del polmone). *Riforma med.*, 1916, xxxii, 296.

In recent years several surgical procedures have been suggested or practiced in chronic lung affections, particularly tuberculosis, such as thoracoplasty, artificial pneumothorax, and more recently the phrenicotomy proposed by Sauerbruch.

Silvestrini has made experiments on dogs to test the effects of phrenicotomy, either unilateral or bilateral, on respiratory dynamics and on the pulmonary and diaphragmatic tissues. From his experiments he arrived at the following conclusions:



1. Unilateral or bilateral phrenicotomy in dogs is not in itself sufficient to suppress lung movement in a practically useful degree.

2. In the early period other respiratory muscle power compensates for the deficiency of diaphragm movement.

3. In the later period this deficiency in the motility of the diaphragm is completely replaced (compensation of contralateral and "surrogate" innervations).

4. Neither in the early nor late period is it possible to observe any modifications of structure in the healthy lung.

W. A. BRENNAN.

**Villeon, P. de la: Operative Extraction of Intrapulmonary Projectiles** (Extraction opérative des projectiles intra-pulmonaires). *J. de méd. de Bordeaux*, 1916, lxxvii, 77.

In a total of 1,700 wounded which have come under the author's observation there were 80 penetrating wounds of the chest. A large proportion of these were carriers of intrapulmonary projectiles. For their extraction the author sometimes employs thoracotomy with costal resection followed by pneumotomy and pleuropulmonary suturing consecutive to restoration of the wall; sometimes he extracts under the radioscopic screen, following Maucclair's method which he has successfully employed for projectiles having a 10- to 12-cm. parenchymatous depth.

Comparing the procedures, he thinks that extraction under the screen is an excellent method, truly marvelous in its simplicity, its rapidity, and in the security which it affords. It only occupies a few minutes, sometimes only a few seconds. The patients are up by the fourth or fifth day and pleural and pulmonary reactions are trivial. He reports 10 successful operations, 7 of which were performed under the screen.

W. A. BRENNAN.

**Binet, L.: Indirect Traumatism of the Lung Due to the Nearby Explosion of Large War Projectiles** (Les traumatismes indirects du poumon déterminés par l'éclatement à proximité des gros projectiles de guerre). *Presse méd.*, 1916, p. 132.

The author cites some illustrative cases to show that after shell explosions, although there is no external injury, hæmoptysis of more or less gravity may be found in those who happen to be in the vicinity of the explosion. These sometimes may be very grave, as in the case of a soldier dying some moments after a shell burst near him without an external wound and in whom an autopsy showed intrapleural hæmorrhages with rupture of the lungs and gastric hæmorrhage.

Regarding the pathogenesis of such hæmoptysis the author points to two theories: (1) the chemical which suggests pulmonary hæmorrhage due to intoxication and (2) the mechanical, an alteration in the pulmonary parenchyma by modifications of the atmospheric pressure. Both may occur in association. As regards the latter, the hæmoptyses ob-

served in such cases are due to an atmospheric depression and are similar to those observed in aeronauts. But in some instances the result following an explosion may be due to compression, and the sudden rush of a quantity of air into the lung under a strong pressure may cause a rupture of some of the pulmonary vessels giving rise to the hæmoptysis.

W. A. BRENNAN.

## HEART AND VASCULAR SYSTEM

**Silvan, C.: A Projectile Penetrating into and Lodging in the Heart** (Di un proiettile penetrato ed arrestatosi nel cuore). *Riforma med.*, 1916, xxxii, 297.

Silvan reports the case of a soldier with a gunshot wound in which the projectile reached and remained in the heart. The surprising fact was that the functioning of the heart continued to be perfectly normal.

As to the manner of the projectile reaching its position it is not improbable, according to Silvan, that before becoming fixed in the cardiac muscle, it reached the right ventricular cavity, where the X-ray examination located it, following the direction of the large vessels. It is logical to think that it encapsulated and fixed itself in its position without effect or harm to the circulatory functions.

W. A. BRENNAN.

**Villeon, P. de la: Three Juxta-cardiac Projectiles Extracted by Three Routes and Different Procedures** (Trois projectiles juxta-cardiaques extraits par trois voies et procédés différents). *Bull. et. mém. Soc. de chir. de Par.*, 1916, xlii, 998.

The three interesting cases reported by the author are as follows:

The first case was that of a long juxta-cardiac projectile, resting against the left ventricle and behind it. Extraction by the high thoracic transpulmonary route was followed by recovery.

The second case was that of a juxta-cardiac projectile, resting against the left ventricle and below it. Extraction by the low, abdominal, transdiaphragmatic route was followed by recovery.

In the third case, there was a juxta-cardiac projectile resting against the left lobe, exterior face. Recovery followed extraction under the radioscopic screen.

The three foreign bodies situated in the vicinity of the heart were extracted, one across the lung, the second by abdominal route across the diaphragm, and the third across the intercostal space under radioscopic control.

W. A. BRENNAN.

**Léris, R.: Ablation of a Foreign Body from the Heart Followed by Recovery** (Sur un cas d'ablation de corps étranger du cœur suivie de guérison). *Rev. de chir.*, 1916, xxxv, 274.

Owing to the importance under the present-day conditions of the question of ablation of foreign bodies lodged in the heart, Léris publishes the

full details of a case operated by him three years ago, in which he extracted a needle fixed in the left lobe of the heart of a child of nine years.

This operation shows that the ablation of a fixed foreign body is less difficult than it is thought to be and that no extensive parietal stripping is necessary. In the case alluded to he resected a costal cartilage and incised the two subjacent cartilages. The heart being exposed he felt nothing on the ventricles; on the other hand above the auriculoventricular sill he easily recognized the needle in the lobe.

Holding the needle between his fingers he made a small incision, extracted the needle, and sutured the wound. There was perfect recovery.

Lériché thinks that in the case of a bullet a similar procedure could be followed. In the case of a foreign body lodged in a wall, and particularly, in a ventricular wall, or even a sequestered foreign body in a corner of the cardiac cavity, intervention can and should be attempted. The position can be clearly determined by radioscopy.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Outland, J. H., and Clendening, L.: Phases of the Chronic Abdomen and of the Acute Abdomen.** *Interst. M. J.*, 1916, xxiii, 337.

The authors show a few of the numerous pitfalls that beset the diagnostician in certain phases of the chronic and acute abdomen. Several cases are used as illustrations.

Quoting tables from Cabot's differential diagnosis the conclusion is arrived at that two-thirds of the abdominal tumors large enough to be easily palpated through the abdominal parietes are either uterine fibroids, ovarian cysts, enlarged gall-bladders, or gastric neoplasms, and that one-sixth of all such are either tumors of the ovary, intestines, or liver, or tubercular peritonitis, or tumor of the spleen or malignant uterus.

The authors recommend these tables in the diagnosing of chronic abdominal conditions, acknowledging, however, their lack of accuracy.

In old people the flabbiness of the abdominal wall must be borne in mind as there will be no rigidity in the presence of acute abdominal inflammation.

A résumé is given of a case diagnosed as tuberculosis of the liver, owing to pulmonary lesions. Operation was performed and sections of the tumor seemed to resemble tubercular processes. Later on, in other hands, the case was proved to be syphilitic.

In the acute abdomen there are no tables of causes and the diagnostician must judge by the symptoms and his experience.

It must be remembered that lobar pneumonia of the right lower lobe can produce pain, rigidity, and tenderness in the right side of the abdomen simulating appendicitis.

In ectopic gestation, the symptoms before rupture are always diagnostic and combined with a vaginal examination of sufficient evidence warrant laparotomy.

A case is cited of an acute abdomen resulting from perforation of an old ulcer in the transverse colon following faecal impaction for eight days.

Another very unusual cause of acute abdomen is perforation of the gall-bladder. However, diagnosis of this condition is rarely made before operation.

A case is reported which was diagnosed as acute appendicitis.

The article closes with the warning that in acute abdominal conditions a cathartic should never be given and all food by mouth should be withheld.

P. M. CHASE.

**Udaondo, C.: Serious Œsophagic Spasms in Cancer of the Cardia of the Stomach** (Espasmos exofágicos graves en el cancer del estomago alejado del cardias). *Prensa. méd.*, Argent., 1916, No. 30, 364.

Œsophagic spasms are considered relatively frequent in certain forms of sensory-motor gastric neuroses, as well as in processes accompanied by tissue losses.

The author had two such cases, which developed insidiously and manifested their existence by the complications present: a severe spasm of the œsophagus simulating in its evolution a process of complete stenosis of the tube. Some of the symptoms were: a progressive dysphagia, mucous expectoration, profuse salivation, secondary inanition, etc.

Cancer of the stomach, in its cycle of evolution, may offer local œsophagic manifestations which may be confused with an organic process in the tube. In the majority of cases an examination with the sound will reveal the purely functional obstacle, which will be confirmed by œsophagoscopy.

Notwithstanding that all conclusions are only relative, the author considers it important to make a minute physico-functional analysis of the stomach in individuals of a certain age in whom there is found a spastic narrowing of the tube without a determinant cause, rebellious to antispasmodic agents and repeated catheterization; at times it is impossible to detect slow processes of gastric degeneration.

RAOUL L. VIORAN.

**Quénu, E.: Extraction from the Abdomen of a Bullet Encysted in the Epiploon, a Year After the Injury** (Extraction du ventre d'une balle de fusil enkystée dans l'épiploon, un an après la blessure). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1024.

Quénu exhibited a fragment of the great epiploon enclosing a bullet. The man was wounded April,



1915, and was operated upon April, 1916. Incision was made, under guidance of the Hirtz compass, somewhat above the position of Jalaguier's incision. On introducing the finger in the abdomen the extremity of the epiploon was felt pursed and enclosing the projectile. The fragment was excised, also the appendix. There was no adherence of the epiploon, either with the abdominal wall or the viscera. The bullet had penetrated through the sacral region into the abdominal cavity without involving any viscera. The fluid contents of the epiploic cyst was not quite sterile, even after the lapse of a year.

W. A. BRENNAN.

**Roulier: Note on 46 Wounds of the Abdomen by War Projectiles** (Note sur 46 observations de plaies de l'abdomen par projectiles de guerre). *Bull. et mém. Soc. de chir., de Par.*, 1916, xlii, 1274.

Of the 46 abdominal wounds reported 31 were perforations. Of these, 4 died almost immediately after arrival at the ambulance and without any intervention. Of the 27 others, 15 were operated upon and in 9 no operative treatment was instituted. Of the 15 operated upon, 6 recovered and 9 died. Of the 12 treated by abstention 9 recovered spontaneously and 2 after a later intervention.

W. A. BRENNAN.

**Schwartz, A., and Mocquot, P.: The Treatment of Penetrating Abdominal Wounds in the Ambulance** (Le traitement des plaies pénétrantes de l'abdomen dans les ambulances). *Rev. de chir.*, 1916, xxxv, 56.

The authors submit this as a contribution to the question as to the course to be pursued in the treatment of penetrating abdominal wounds of war; i.e., whether to operate or to abstain.

The arguments advanced against operative treatment are of two varieties—scientific and military.

The scientific arguments are: the tendency of such wounds to spontaneous recovery, the baneful influence of the shock, and the bad results given by operation.

The authors find that spontaneous recovery of abdominal wounds with intestinal perforation is rare and in cases where recovery takes place it is very difficult to say whether or not there was a real intestinal perforation. In the absence of surgical intervention there is apt to be errors in diagnosing perforating wounds. The fact that certain simple penetrating wounds, or even in rare cases intestinal perforating wounds, recover spontaneously is not a sufficient argument against operation if it can be proved that laparotomy can cure wounds which would not have healed spontaneously.

As regards shock, the authors think that the state of shock in which a wounded patient may be is not an absolute operative indication because they think that the best means of remedying the grave conditions which the site of shock indicates is to operate.

Against the third argument, the bad results

obtained from operation, the authors submit their own statistics. They have done 60 laparotomies for penetrating abdominal wounds. Of these, 41 are dead and 19 recovered, 31 died within three days after the operation. In these cases lesions were irremediable. Several had fully developed peritonitis; they would have died without operation and they died in spite of it.

Of the 19 recovered cases, 9 had penetrating intestinal wounds, 7 had visceral perforations. Some of these might have recovered spontaneously, but the greater part have been cured by the operation and the authors think that it requires no argument to show that laparotomy is the best treatment for abdominal wounds.

The arguments of a military nature against operation are: The delay in arrival of the wounded; the difficulty of finding aseptic conditions; the length of the operation; and the difficulty of handling hundreds of wounded arriving simultaneously.

The first two arguments are easily disposed of by good organization and equipment. The authors have not found it necessary to neglect others in order to perform laparotomy in an ambulance service. Moreover, this procedure requires no more time than is required in a serious limb injury.

The indications for operation are discussed, also the diagnostic principles, operative technique, and operative prognosis. Short details of each of their 60 cases are given.

W. A. BRENNAN.

**Pfeiffer, D. B.: Factors Influencing the Present Mortality of Peritonitis.** *Penn. M. J.*, 1916, xix, 604.

With a view of determining the present status of preliminary medical treatment and its influence upon morbidity and mortality, sixty-three recent cases of appendicitis, complicated by local or diffuse peritonitis, have been analyzed, with the following findings:

Not purged before admission, 7; recovered, 7; died, 0.

Opiates before admission, 22; recovered, 18; died, 4.

No opiates before admission, 41; recovered, 38; died, 3.

Food or liquid by mouth, all.

Enteroclysis, none.

Fowler or sitting posture, none.

The author protests against the stereotyped methods of treatment of abdominal pains and colics. The great pitfall for the practitioner lies in the fact that many abdominal pains are not due to surgical conditions and, secondly, in the difficulty of differentiating surgical disorders in their early stages from the lesser maladies. Until a very few years ago, the purge was thought to be a very good introduction to the treatment of any disorder, abdominal or otherwise.

When the practitioner learns to treat all cases of abdominal pain with masterly inactivity during the period of indeterminate diagnosis, when he

does nothing that runs counter to the principles of treatment set forth, when he calls a competent surgeon at the earliest indications for operative treatment, the mortality from the acute abdomen will approach the vanishing point.

EDWARD L. CORNELL.

**Quarella, B.: An Interesting Case of Double Retrograde Strangulation** (Su di un interessante caso di doppio strozzamento retrogrado). *Gior. d. r. Acad. di med. di Torino*, 1915, lxxviii, 382.

This very interesting and comparatively rare case occurred in a man who while working was suddenly seized with abdominal pains, nausea, and persistent vomiting. The attending physician diagnosed the existence of a strangulated inguinal-scrotal hernia which he tried vainly to reduce and had the patient sent to the hospital.

By an incision parallel to Poupart's ligament, the hernial sac was isolated and found to contain two intestinal loops in a good condition of nutrition and only slightly congested. The existence of a hydrocele was discovered in the right testicle from which a citron-colored fluid escaped. Of the two loops found in the hernial sac, the right was formed from the cæcal ampulla with the base of the appendix (about 1 cm.), and the terminal tract of the ileum (15 to 20 cm.); the left from a loop of the small intestine about 20 cm. long.

At operation the abdomen was found to contain a quantity of hæmorrhagic, foul-smelling fluid. By traction of the cæcum a portion of the ascending colon, normal in aspect, and the appendix, which was dark in color evidently by sanguinary infarcts, were extracted. The author then proceeded to extract the segment of the intestine intermediate to the two herniated loops. This for about one-half meter in length was only slightly dilated and blackish blue in color studded with hæmorrhagic infarcts and was evidently necrosed; the mesentery for a distance of 6 to 7 cm. from its intestinal insertion showed identical coloration with profuse thrombosis.

The author made a typical appendicectomy followed by resection of the necrotic intestinal segment with circular entero-anastomosis. After the reduction of the intestine into the abdomen the hernial sac was resected and the peritoneal breach closed by linear sutures. The hydrocele sac was partly resected. The patient had fully recovered by the seventeenth day after operation.

In discussing this case the author stated that the term retrograde strangulation was introduced by Maydl in 1895 to indicate the condition by which part of the strangulated organ is found internally in the abdomen while the remainder is found in the hernial sac. Maydl reported two such cases and since then several more have been reported and many theories have been suggested to account for the condition. Nevertheless it must be confessed that retrograde strangulation of the intestine re-

mains today one of the most obscure phenomena in the field of surgical pathology.

The author thinks that the findings in his own case favor the theories of Lauenstein and Lorenz. According to Lauenstein, traction on the two external loops may give origin in the mesentery of the interior loop to a springing formation in the form of an arc with its concavity toward the ring. Peripherically the mesentery would remain free and fluctuant; centrally toward its roof it would find itself exposed to a greater or less tension. According to Lauenstein this tension is the impediment to free sanguinary circulation. Lorenz thinks that secondary meteorism of the internal loop makes it rigid so that the peripheric part is constricted and distended, causing the production of a sharp angle at the level of the arcade described by Lauenstein.

W. A. BRENNAN.

**Chaput: Treatment of Large Crural Hernias by Pediculated Adipose Graft** (Traitement des grosses hernies crurales par la greffe adipeuse pédiculée). *Rev. de gynéc.*, 1916, xxiii, 431.

Chaput finds that most methods in use for the treatment of large crural hernias are inefficient. He now gets excellent results from the use of fat grafts.

The same incision is made as for inguinal hernia. The peritoneum and hernial sac are drawn into the inguinal wound, a supplementary thigh incision being made if required. Sutures are useless for the obliteration of the crural ring. He therefore closes it with a pediculated strip of fat which is sutured to the edges of the ring. A rectangular strip is cut, about two fingers wide and 10 cm. long, the base of which corresponds to the pubes and the inner border at the median line. The dissection is carried as far as the aponeurosis. The rectus muscle is incised, the peritoneum stripped from the wall, and the graft introduced. The graft is sutured to Gimbernat's and Cooper's ligaments, and to the crural ring. The summit is divided, the posterior part being fixed to Cooper's ligament behind the crural vein, and the anterior part fixed to the crural ring in front of the vein. Chaput has operated upon five patients in this way with success.

W. A. BRENNAN.

## GASTRO-INTESTINAL TRACT

**Boas: Occult Bleeding in Ulcus Ventriculi and Stomach Carcinoma** (Beitrag zur Kenntnis der okkulten Blutungen bei ulcus ventriculi und Magenkarzinom). *Arch. f. Verdauungskr.*, 1916, xxii, Nos. 2 and 3.

While there is a very great similarity between ulcus ventriculi and carcinoma of the stomach when viewed casually, on closer examination it is seen that the occult bleeding which occurs in both differs not only in the manner of occurrence, but also in the form. In the case of carcinoma the bleeding



is persistent while in ulcer there is a relatively quick disappearance of the blood; also there is a difference in the intensity of the bleeding in both cases. From a consideration of these two differentiating characteristics Boas advances as an essential condition in the diagnosis that examination of the faeces alone with regard to the occurrence of occult blood is not sufficient, but that the examination of the stomach contents should also receive great consideration. By this procedure it will be possible to reduce the number of unnecessary operations now made in the case of unhealed ulcers which are not recognized as such, and to have such operations reduced to a reasonable limit.

W. A. BRENNAN.

**Leonard, V. N., and Dayton, A. B.: Multiple Acute Gastric Ulcers After Using Percy's "Cold Iron" for Inoperable Carcinoma; Preliminary Report of a Fatal Case.** *J. Am. M. Ass.*, 1916, lxvi, 1549.

In this case rigid application of Percy's "cold iron" was ineffectual in eradicating the carcinoma and was followed by death after four days with lesions similar to those of extensive cutaneous burns.

The case is as follows: A woman, age 52 (two children), had had no bleeding since the menopause at 42 until November, 1915. Then she had profuse vaginal bleeding for five days, which recurred once. Further symptoms were loss of weight, slight pain, constipation, and painful defecation. Pelvic examination showed the cervix entirely destroyed by a rough, firm growth extending far out into each broad ligament, fixing the uterus firmly in the pelvis.

At operation the technique most recently advocated by Percy was rigidly followed in every detail. On the second, third, and fourth days after the operation, there was acute gastric dilatation. On the third day there was a urinary fistula, and on the fourth day a paralytic ileus. During preparation for enterostomy the patient died suddenly.

At autopsy the peritoneal cavity contained 180 ccm. of serosanguineous fluid with a little fibrinous exudate at the operative site. The intestines were distended. No obstruction could be demonstrated. The pleural cavities each contained 500 ccm. of bloody fluid. There were a few subserous ecchymoses. Extensive pulmonary oedema was present. The stomach was distended with gas. Its mucosa was perforated by about 24 clean, round ulcers which measured from 1 to 7 mm. in diameter. Microscopically the loss of substance extended to the submucosa and was unassociated with any cellular change.

Grossly and microscopically intact squamous cell carcinoma was found peripheral to large areas of general necrosis. Many mitotic figures were seen. In one area seemingly dead carcinoma was found in the midst of normal looking connective tissue. Examination of the regional lymph-glands revealed no carcinoma.

EDWARD L. CORNELL.

**Pauchet, V.: Surgery of the Posterior Wall of the Stomach; Method of Choice in Approaching the Rear Cavity of the Epiploon** (Chirurgie de la face postérieure de l'estomac; méthode de choix pour aborder les organes de l'arrière-cavité des épiploons). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1128.

The author has been using the method of colonic-epiploic detachment recommended three years ago by Lardennois and Ockinzyc for total colectomy. He has found the procedure applicable in four-fifths of cases of gastric surgery and he considers it the true method of approach in repairing stomach perforation, removing a stomach cancer, in pancreatic tumor, etc. He has found it immensely superior to the gastrophatic, the transmesocolic, or the gastrocolic route.

The procedure liberates the transverse colon and separates it from the epiploon. This allows examination of the posterior face of the stomach, the duodenum, and pancreas. While an assistant pulls down the transverse colon the operator raises up the grand epiploon, and attacking the serous coat of the transverse colon with the bistoury detaches the epiploon and stomach from the transverse colon without injury to any vessel.

The author believes this procedure widens the field of exploratory surgery of the gastric region, and facilitates the discovery and removal of lesions which direct exploration does not.

W. A. BRENNAN.

**Ernst, N. P.: A Case of Congenital Atresia of the Duodenum Treated Successfully by Operation.** *Brit. M. J.*, 1916, i, 644.

The child, a boy, was robust at birth and there was no history of deformity in his family. He weighed 4,300 grams and showed no external sign of any malformation. From the first the child always vomited after suckling. On the third day he took the breast more actively than at first, but two or three hours later he began to vomit, with almost explosive violence. Very little urine was passed and the movements were limited to a small amount of typical meconium, without a particle of digested milk.

At operation an incision between 7 and 8 cm. long was made a little to the left of the middle line. After the anterior sheath of the rectus had been laid bare, Mosetig batiste was sewed to the edges of the skin with continuous silk suture so that the integuments were completely covered. On opening the peritoneum, the dilated stomach protruded into the wound and was traced along the dilated pylorus into the duodenum, which was uniformly about two finger-breadths in width as far as it could be traced to the upper side of the transverse mesocolon. Below the colon, where the intestine reappeared, at the flexura duodenojejunalis, it was seen to have collapsed to the caliber of an ordinary pencil, about 8 millimeters in diameter. The remaining part of the small intestine was examined quickly, especially its lower portion, but no stenosis was discovered.



A duodeno-entero-anterior anastomosis was made. A coil of small intestine about four inches below the flexura duodenojejunalis was drawn up in front of the transverse colon and united to the duodenum about the junction of the pars superior and pars descendens.

The intestines were held during the operation by Doyen's straight soft intestinal forceps; continuous seroserosal suture was applied, then a continuous suture through all the layers the entire way around; and, finally, a continuous seroserosal suture was applied on the front. When a stomach-tube was passed through it, a good deal of air and greenish fluid was discharged. The intestinal forceps were removed and immediately afterwards the jejunum began to fill. The walls of the abdominal incision were united with deep catgut sutures and interrupted silk sutures were applied to the sheath of the rectus and skin.

A few hours after the operation, the infant was given a weak mixture of milk and water, about 30 ccm. every two hours. He vomited a little several times in the course of the day and at 8 p.m. more violently, so that the stomach tube was used and a little greenish fluid evacuated. At 7 p.m. an enema was given, but without any result.

The next day he was given one teaspoonful of castor oil twice and three enemata and had altogether four alvine discharges, which, without any doubt, contained digested milk. The child's appearance was good. No more violent vomiting occurred, but there was slight sickness for some days. The bowels acted daily and the stools soon appeared quite normal. The temperature also fell to normal. Five days after the operation the child was sent home to be nursed by his mother. The dressings remained untouched until the fourteenth day, when all sutures were removed; the wound had healed by first intention.

The infant's weight decreased during the first five days 90 grams more and was then 3,400 grams, or 900 grams less than at his birth; but afterward it increased considerably more than 250 grams a week continuously for several months. Meals were soon allowed every third hour and when a few weeks had passed, the child could sleep all night without food. He is not remarkably quiet for his age, is vigorous and well developed. His weight one year later was 11,200 grams.

This is the second case of its kind in the literature.

EDWARD L. CORNELL.

**Carman, R. D.: The Roentgenologic Diagnosis of Duodenal Ulcer.** *Am. J. Roentgenol.*, 1916, iii, 252.

The author's experience in the last year leads him to believe that deformity of the duodenal shadow is a valuable sign in the diagnosis of duodenal ulcer. However, errors may arise from the following conditions: (1) Adhesions or spasm may cause an identical deformity. (2) Some ulcers do not produce a deformity. (3) It is sometimes difficult or impossible to sufficiently distend the duodenum to

definitely decide whether deformity is or is not present.

In regard to the first objection, the most common cause of deformity is undoubtedly ulcer.

To the second objection, while some ulcers are so very small that they can hardly be palpated at operation, still there is usually an accompanying spasm which causes a deformity out of proportion to the lesion and it can be demonstrated by serial radiography. To fill the cap in difficult cases the author uses the horizontal position with the patient prone or on the right side.

Carman has used serial radiography for a year with what he considers satisfactory results and an increase in correct diagnosis.

Deformities of the bulb come under four headings: (1) the greatly distorted type, resembling a small pine tree; (2) the niche type where the actual crater of the ulcer is visible; (3) the incisura type, single or bilateral; (4) the very small bulb of smooth contour, representing a much contracted duodenum.

In addition to duodenal deformity the author considers gastric hypertonus, hyperperistalsis, hypermotility, with a six-hour residue, valuable diagnostic signs of duodenal ulcer. Although none of these conditions are pathognomonic of ulcer, a proper correlation of the findings taken in connection with the history go a long way toward making the diagnosis.

G. W. GRIER.

**Martini, T.: Chronic Ulcer of the Duodenum and Its Gastric Repercussion** (La ulcera cronica del duodeno y su repercussion gastrica). *Prensa med.*, Argent., 1916, No. 32, 381.

The indirect symptoms of duodenal ulcer are those showing a reflex alteration in the functions of the stomach.

Among the clinical symptoms that form the classical syndrome of duodenal ulcer, the most significant are those derived from secretory and motor disturbances of the stomach.

Martini employs the analytical method, and studies the gastric secretion both before and after the ingestion of the test-meal of Edwald-Winther. He then studies the gastric motility by the aid of radioscopy.

The exploration of the motility of the stomach in the author's cases revealed a marked peristaltic insufficiency with a median gastroparesis and an abnormal elongation toward the right; a hyperfunctional peristalsis, especially expulsive; slow and difficult pyloric evacuation, bismuth being found in the stomach six hours after ingestion.

The author found it difficult to make a diagnosis of duodenal ulcer in the presence of the gastrosuccorrhœic syndrome of Reichmann, which he considers adaptable to two types of duodenal ulcer: (1) when the ulcer is found situated toward the pyloric sphincter, and (2) when besides its location near the sphincter, it is complicated at its level by cicatricial retraction and consecutive stenosis. A chronic duodenal ulcer complicated by stenosis



modifies entirely the clinical aspect of a simple ulcer of the same nature. The author considers the surgical control as insufficient in 30 per cent of the cases; the only satisfactory information can be derived from an autopsy.

The syndrome of gastric hypersecretion, permanent, of the type of Hayem, is the most eloquent manifestation of a duodenal ulcer. **RAOUL L. VIOIRAN.**

**Davis, B. F.: Treatment of Devascularized Intestine.** *Interst. M. J.*, 1916, xxiii, 318.

The paper is based upon the results of a series of experiments in which 31 dogs were used. These results seem to show that in normal dogs a loop of small intestine one inch in length may be completely separated from its mesenteric blood supply with relative safety, although gangrene with perforation and peritonitis may occur, and replacement fibrosis of the devascularized segment with consequent narrowing of the bowel lumen may occasionally be expected. The frequency of one or the other of the above accidents increases rapidly as the length of the devascularized segment is increased, until, at a segment length of four inches, gangrene with complete destruction of the involved loop or replacement fibrosis with contraction becomes the rule. Segments an inch or less in length may be treated conservatively; longer segments are more apt to require radical treatment, while devascularized segments four inches in length demand resection.

Omentum wrapped about completely devascularized intestine cannot avert necrosis, and should necrosis occur the omentum may be efficient in walling off infection if the necrotic area is small in extent but it cannot be depended upon to confine the intestinal contents and prevent peritonitis.

**Thompson, W. M.: Post-operative Ileus.** *Surg., Gynec. & Obst.*, 1916, xxii, 688.

After a review of the mortality statistics the author discusses the causes of death in post-operative ileus. Clinically and experimentally it is shown to be due to a toxin absorbed through an animal membrane. Distention and circulatory disturbance are the main causes of this abnormal membrane. The surgical treatment has been enterostomy and resection. The majority of surgeons advise enterostomy, followed by resection, and some advise immediate resection if the intestine is so far damaged as to be abnormal. A series of experiments was carried out on dogs in an effort to devise a safer method of operating for ileus. The endeavor was to produce ileus in the dog that presented as nearly as possible the same pathological picture as is found in the human. The animals were then short-circuited by avoiding the diseased gut and making either an ileocolostomy or an ileo-ileostomy. At the end of six weeks or two months the dogs were killed and the intestines studied. The results are summarized in the following conclusions:

1. We believe that the best results are obtained in the treatment of inflammatory ileus by enteros-

tomy and drainage in cases that are so ill that radical measures would be fatal. Enterostomy should be done rapidly and without disturbing the adhesions. When the patient recovers ileo-ileal anastomosis, closure of the enterostomy wound, and cæcostomy or appendicostomy will complete the cure.

2. In favorable cases ileo-ileal anastomosis with cæcostomy or appendicostomy for drainage and to relieve the back pressure in the colon gives the best results.

3. By short-circuiting and putting the damaged gut at rest it may be restored to health and function, even after vascular changes have taken place.

4. The mortality of resection for this disease is too high to give it a place in the treatment of inflammatory ileus.

5. The adhesions should not be broken up nor the damaged gut handled in the operation.

**Collin, I.: Appendicitis of Extra-appendicular Origin** (Exoappendicite d'origine extraappendiculaire). *Nord. med. Arch., Stockholm*, 1916, xlix, *Kirurgi*, 5.

Collin discusses appendicitis due to peritonitis which attacks the external layers of the appendix the same as other organs with serous membranes. Exo-appendicitis figures eventually in the greater part of abdominal troubles which produce a non-localized peritonitis; but it most frequently is coincident with a salpingitis or with a perforating ulcer of the stomach or duodenum.

Collin gives some cases illustrative of different forms of peritonitis arising from the female genital organs and which involve the appendix, from the study of these he endeavors to construct a clinical picture for the purpose of differential diagnosis. In exo-appendicitis it is rare that the trouble begins by the initial paraumbilical pain so well known in true appendicitis — neither is there pain nor sensitiveness in the ileocecal region; these symptoms are not noted until later on; that is to say, the local symptoms of appendicitis including pain and irritability of McBurney's point are not manifest in exo-appendicitis until after the signs of an extended peritoneal affection are noted.

Exo-appendicitis does not of itself call for treatment; it is the progress of the peritonitis which indicates operation. When an appendix, removed for a suspected appendicitis, is found to have its mucus normal and the inflammation confined to its external layers only, it is necessary to seek further for the cause of this exo-appendicitis. In the case of a woman the genital organs must be examined; the incision already made may be sufficient or it may be necessary to extend it, but if the peritonitis proceeds from a perforated stomach or duodenal ulcer exploration is manifestly more difficult.

As to the differential symptomatology of perforated ulcer and appendicitis, the author believes that where there is doubt as to the diagnosis it is best to decide on a laparotomy. Commencing with the appendix, if there is no manifest perforation or



necrosis, it must be remembered that even a very advanced inflammation of the appendix may be due to an infection of extra-appendicular origin.

To make sure that the appendix is the cause of a peritonitis the epigastrium should be incised and the stomach and duodenum examined. The mere fact that no exudate is noted from this region, is not sufficient, because often an exudate finds itself a pathway by the inclined parts to the left and nothing is found in front or to the right.

W. A. BRENNAN.

**Guthrie, D.: The Prevention of Fæcal Fistula in Suppurative Appendicitis.** *Ann. Surg., Phila.*, 1916, lxiii, 452.

From his experience with 853 drainage cases in which the author has had three fæcal fistulæ, Guthrie concludes that the following factors are of primary importance in their prevention:

1. The muscle-splitting incision should be used except in those cases in which the abscess is well defined near the median line. In these cases the author believes the straight incision should be used.

2. The treatment of the stump. Whenever possible, the author has inverted the stump, using two rows of catgut and no non-absorbable material. Where this has not been possible, he has resorted to the old cuff operation, turning down a cuff of the thickened peritoneal coat, ligating the stump with catgut and tying the fold of peritoneum over it.

3. The third factor is drainage. The author uses large soft rubber tubes, which he places as far away from the head of the cæcum as possible and shortens them as soon as it is deemed safe. Laxatives are never given until all drains are removed. He believes that gauze does not act as a drain and is conducive to fistulæ formation.

GATEWOOD.

**Secord, E. R., and Coates, L. H.: The Results of a Year's Work in the Treatment of Acute Appendicitis.** *Canad. M. Ass. J.*, 1916, vi, 421.

Of 46 cases of acute appendicitis operated upon by the authors, one died, one of seven cases with generalized peritonitis. Thus it would seem that the mortality rate from acute appendicitis should be very small and it is believed that the important essentials of a non-mortality treatment consist of early diagnosis and removal at the earliest time possible. The authors wish to correct an impression that appendix cases should not be operated upon after the third day unless or until a localized abscess has evidently formed. An inflamed appendix should be removed immediately, no matter what day of the disease, thus saving a certain large percentage of desperate cases.

A mistaken application of the dictum that elevated temperature is a constant symptom of appendicitis must be avoided. While an elevated temperature is probably always present some time during the course of the attack, it is by no means a constant symptom of a gangrenous or a localized peritonitis. A dead appendix no longer gives the

symptoms of appendicitis and the absence of fever has frequently been responsible for delay on the part of the medical attendant.

Inversion of the appendiceal stump is opposed, the stump being a potential source of infection and the general peritoneum being better able to deal with it than the tiny sac of peritoneum with which the stump comes in contact after the application of a purse-string suture. Inversion of the stump without primary ligation is opposed also, because of the danger of hæmorrhage. If the appendix contains pus but the peritoneum is free a rubber-tissue wick is left down to the cæcum; in the presence of a localized abscess tube drainage is used; if generalized peritonitis is present, a drain is always placed to the bottom of the pelvis. In all pus cases the immediate use of a stock preparation of mixed infection vaccine is urged. In the latter class of cases the Fowler position and the Murphy drip are also used, and, if post-operative ileus is feared, injections of eserine are advised.

E. K. ARMSTRONG.

**Shaw, H. A.: Appendicitis; Some Practical Suggestions Based upon Personal Experience.** *Northwest Med.*, 1916, xv, 155.

In general, Shaw does not agree with the dictum laid down by Ochsner, regarding the time to operate in acute cases, nor can he accept Binnie's version — "When a case is seen too late for early operation, and tumor is present, and the pulse and general condition indicate a dangerous absorption, if the tumor is increasing markedly, and there are signs of infection spreading, no surgeon would hesitate as to operation, interference is imperative," because: (1) temperature is a most deceptive guide; (2) general conditions are often totally at variance with local conditions; (3) the impossibility of outlining the tumor mass with a rigid belly; (4) and, to await the signs of infection spreading seems to be like "locking the stable after the horse is stolen."

Shaw believes that the time to operate upon acute cases of appendicitis is immediately after the diagnosis is made, after the twenty-four hour period, opinions and statistics vary, which difference, he thinks, is due to poor operative technique and judgment, poor ante- and post-operative treatment and deficient comprehension of the underlying pathological conditions. In over 600 cases, 20 per cent of which were estimated as acute, Shaw has had 6 deaths. He believes that in the surgical treatment of appendicitis there are no hard and fast rules. All preliminary catharsis is contra-indicated on account of the dangers of septic dissemination and the increased post-operative tympany and pain, as well as the deferring of the operation for several precious hours, awaiting their uncertain action. Where cathartics have been administered, the muscularis is still active for several hours after the operation, terrifically increasing the gas pains and being totally inefficient as a cathartic. He also holds this true of the so-called "high enema."

In the preliminary preparations for the operating



field, he believes: (1) in a thorough shaving of the whole abdomen; (2) a very gentle scrubbing of the abdomen with green soap and a lysol solution, rinsing with sterile water; (3) application of alcohol packs. The immediate preparation, he believes, should be to first mop the umbilical and inguinal regions with benzine sponges followed by fresh benzine sponges for the remainder of the abdomen; after drying with a clean sponge a 50 per cent alcohol solution of tincture of iodine is applied, followed with a sponge saturated with alcohol to remove the greater part of the iodine. (Since submitting this article for publication, the author has adopted the use of McDonald's solution.)

In the making of incisions, a thorough anatomical knowledge of the part is necessary, especially of the innervation of the abdominal walls, since an injury to the nerve supply is far more serious than simple incision of soft parts. In acute cases, past the twenty-four hour period, the usual incision of choice is the "gridiron" incision, modified to meet the individual indication. Where there is a palpable mass, incision is to the center, over the mass. It is well to make the incision moderate at first, but susceptible to rapid enlargement; the author believes the low "gridiron" incision, and, when necessary, the addition of Harrington's extension to be ideal.

He also believes in the center of the "gridiron" incision being about one inch lower than McBurney's "gridiron" incision, for the following reasons: (1) the most difficult part of the operation is the delivery of the appendix without rupture; (2) the lesser danger to the twelfth thoracic nerve.

The external oblique is cut transversely in emergency, this, however, being a "court of last appeal," for it necessitates the severance of the fascia at an angle to the direction of its fiber, which, in the presence of infection, means an added danger of post-operative hernia. In chronic cases, and those within the twenty-four hour period, and those where the tumor mass is central, or when there is doubt whether the lesion is appendicular or pelvic, he makes a mediolateral incision, which he considers the most practical incision in surgery, because its advantages are multiple and its execution so simple. He has used this incision in more than 1,000 pelvic and abdominal cases and has never found cause for regret. The following advantages are claimed: (1) rapidity and simplicity; (2) minimum destruction to nerve supply; (3) external strong belly wall left, due to muscular interposition and lack of organic injury; (4) beautiful exposure and ability to make a general exploration and to perform any ordinary work in the lower abdomen or pelvis; (5) absence of hemorrhage and no tearing of muscles.

In cases requiring drainage, recourse may be had to one of the three following procedures: (1) through a simple stab wound away from the primary wound make a hole in the muscle for the drain in line with the skin and facial incision; (2) omit tacking muscle to the median line at the lower end of the wound.

Shaw never drains through a primary wound, but always through a stab wound, and where the drain is in proximity to the deep epigastric vessel, he ligates the same well above and below the drain. The delivery of a retrocaecal appendix he believes, can be greatly simplified by mobilizing the lower part of the colon in the conventional manner, and tacking it back immediately after the delivery. He does not advise the use of absorbent sutures to bury the stump in the drainage cases, but uses instead, fine chromic gut mounted on Dulox needles. He believes in removing the appendix when the same can be done without undue risk of breaking up adhesions, and dissemination of infection into the general cavity or unduly prolonging the operation in the case of septic or debilitated patients. The appendicular visceral peritoneum in acute cases should be considered as septic and handled gently, and, if possible, should be kept wrapped in gauze from the beginning to the end of the operation. Ligation of the meso-appendix is best accomplished by either the Watkins stitch or by the author's original stitch. Under no circumstances does he irrigate, and the use of peroxide of hydrogen he considers little short of criminal. He believes in carbolicizing the stump, but does not follow with alcohol, and believes in making the purse-string suture ample. In cases complicated with dense adhesions, where it appears best to sever the appendix first at the caecal attachment, this is done with a knife close against the forceps attached to the distal portion, and the stump is buried at once. He believes it possible to attach towel clips to the peritoneum, and, in some cases, to attach towel clips to the peritoneum, the skin, and gauze at the same time.

Suggestions as to the type of drainage follows: (1) In simple cases, where there is doubt as to the necessity, a small cigarette drain is inserted. (2) In purulent cases, well walled off, where the appendix has been removed, a large cigarette drain is employed. (3) In purulent cases, where it has been impossible to sever the appendix and there is a well-walled off cavity, a good-sized tubular drain is used. (4) In cases not walled off, a large sized tubular drain with one, two, or three cigarette drains at strategic points is used.

Drainage tubes should be soft, should not impinge with force on the debilitated walls of gut, and should not come in direct contact with any suture lines involving the gut, and should be placed in dependent parts. In cases where the drainage is through a stab wound several strands of silkworm gut are inserted in the lower angle of the original wound; where the anæsthetic has been unduly prolonged, or where the operation has necessarily followed several hours after the ingestion of food, gastric lavage is recommended.

In the after-care of drainage cases, Shaw uses the Fowler position and the Murphy drip method, using sugar instead of salt solution. In the post-operative care of the wound, after four or five days, when the discharge is extremely thick and heavy it is some-



times washed out with six or eight ounces of salt solution, to mechanically remove the chief amount of débris. After the first forty-eight hours Shaw invariably washes out and fills all cavities and saturates all drains with alcohol (U. S. P.), at least once and sometimes twice, daily, for the following reasons: (1) Alcohol is a harmless antiseptic. (2) It is a mild astringent. (3) By its hygroscopic action it promotes a local outpour of serum with its contained antibodies. (4) Even when diluted with transudates or exudates it makes a poor culture medium. (5) When it first comes in contact with the great mass of superficial débris, it encapsulates large numbers of micro-organisms. (6) It does not render soluble and wash away the primary plastic lymph, either in the healing abdominal wall or the peritoneal surfaces.

Shaw uses, as a routine, four to eight ounces of saturated solution of magnesium sulphate, at 98°, slowly introduced into the rectum with a No. 9 catheter, twenty-four hours after the operation, except in cases of extreme debility and anæmia.

EMIL C. ROBITSHEK.

#### LIVER, PANCREAS, AND SPLEEN

**Perussia, F.: Partial Hepatoptosis Due to Interposition** (La epatoptosi parziale da interposizione). *Riforma med.*, 1916, xxxii, 337.

Radiologists understand by hepatoptosis the condition shown in the radiologic picture characterized by the transitory and partial interposition of intestinal loops between the convex surfaces of the liver and the diaphragm. It is transitory because it may disappear momentarily owing to changed conditions of meteorism of the intestinal loops; by changes of endo-abdominal pressure; or by changes in the position of the patient. The interposition is partial because the liver does not lose complete contact with the diaphragm, the posterior border maintaining intimate contact with the posterior walls of the abdomen and the diaphragm, while the external and anterior parts recede.

In his experience and study of this radiologic picture the author has noticed a certain coincidence of morbid facts which cannot be considered casual and he gives an etiopathogenetic conception of hepatoptosis which is different from that usually accepted. This coincidence consists of organic alteration of the gastro-intestinal tube. Of 5 patients studied 3 showed a pyloric stenosis with grave secondary gastrectasia; in the other 2 there was benign pyloric stenosis with hour-glass stomach due to mediogastric stenosis caused by ulceration of the small curvature. In all the 5 cases the interposition of intestinal loops between the liver and diaphragm coincided with a meteoric condition of the colon and the degree of hepatoptosis was proportionate to the intestinal distention.

The authors review the literature of hepatoptosis and show that in the greater part of the observations reported in which the condition of the gastro-

intestinal tract was described the coincidence referred to above was found.

The existence of this coincidence explains the mechanism of the phenomena and leads to a conception of hepatoptosis different from the usually accepted one which ascribes it to anomalies of the methods of fixation. The new conception makes the predominant factor of the phenomenon the alteration of the gastro-enteric tube.

Partial hepatoptosis by interposition is distinct from the wandering liver of Cantani and from Glenard's hepatoptosis, the first showing a complete fall of the viscera and the second showing a false ptosis and a deformed unusually mobile liver.

W. A. BRENNAN.

**Case, J. T.: Some Statistics on the Negative and Positive Roentgen Diagnosis of Gall-Stones.** *Am. J. Roentgenol.*, 1916, iii, 246.

The author's statistics may be divided into five groups as follows:

1. Positive roentgen report of gall-stones with stones found at operation: 20 cases out of a total of 41, making a percentage of successful positive diagnosis of 49 per cent.
2. Positive report and no stones found at operation, 4 cases.
3. Negative report and no stones found at operation: 244 cases out of 257, making a percentage of successful negative diagnosis of 95 per cent.
4. Negative report and stones found at operation 13 cases, failure to diagnose in 5 per cent.
5. Report of probable gall-stones: out of 22 cases, 8 were found to have stones, and in 14 no stones were found, a percentage of correct diagnosis of 36 per cent.

Of the 13 cases in Group 4, 9 had disease of the gall-bladder other than stone; and of the 14 cases of Group 5 where no stones were found 11 had diseased gall-bladders.

Out of a total of 55 cases with diseased gall-bladder, X-ray evidence pointed definitely to this condition in 48 cases, or in 88 per cent, while gall-stones were accurately shown in 50 per cent of the cases where they were present.

G. W. GRIER.

**DePage, A.: Note on Twelve Cases of Splenectomy for Wounds** (Note sur 12 cas de splénectomie pour blessures de guerre). *Bull. et mèm. Soc. de chir. de Par.*, 1916, xlii, 1293.

The earlier reports from the war zone concerning splenectomy for war injuries showed that the operation was almost invariably fatal. The cause was attributed to perturbation in the economy by suppression of a gland all the functions of which are not yet known.

DePage has up to now practiced 12 splenectomies with 8 deaths. Of the 12, there were 4 in which the spleen alone was injured, and of these there were 3 recoveries. In the other 8 cases the injury to the spleen was accompanied by injuries of other organs.



The author thinks that the very special gravity which is attributed to removal of the spleen depends particularly on concomitant lesions of other organs.

W. A. BRENNAN.

**Riggs, T. F.: End-to-End Suture of the Bile-Ducts.**  
*Surg., Gynec. & Obst.*, 1916, xxii, 660.

The author outlines briefly the mechanism of obstruction and occlusion of the bile passages and enumerates the recognized methods of repair or reconstruction which might be used for the relief of any given case.

He reports three unsatisfactory end-to-end anastomoses of the bile-ducts in dogs and describes in detail a successful operation on a man for a cicatricial

obstruction to the bile-duct requiring excision of three-fourths of an inch of the common duct. Pathologically, the excised mass proved to be composed entirely of scar tissue and the fact that the patient is still in good health confirms the findings of the laboratory. The author reports in this connection a hitherto unpublished case from the clinic of Elting of Albany in which the laboratory report was that of benign stricture but which later proved to be a carcinoma.

A tabulated list of the cases previously reported is included. Attention is drawn to the fact that in approximately 90 per cent of the cases reported, repair of the bile duct was necessitated by accidental injury, and emphasis is laid upon the necessity of extreme care in operations upon the gall-bladder.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Picqué, R.: The Immediate Treatment of Articular Wounds in a Field Ambulance** (Du traitement immédiat des plaies articulaires dans une ambulance de l'avant). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 930.

Picqué reports the results in 47 cases of articular wounds treated in his ambulance service at the front. Of the 47 cases, 12 were treated prior to March, 1915. Of the 12, 7 were treated by early evacuation. The result is not known. Five cases which were under observation all died from septicæmia.

Since March, 1915, 35 cases were cared for; 34 were treated by economic resection and 1 by amputation. All 34 recovered. There was 1 death from gaseous gangrene. The details of the 47 cases are given and the various aspects of the subject, principles of intervention, operative indications, technique, etc., are fully discussed.

Picqué says the excellent results obtained agree with those of other surgeons at the front; but they are due in his case to a typical resection modeled on the lesions.

The evolution of articular wounds, like all other war injuries, has undergone metamorphosis due to the perfection of the surgical installation and the application of the fundamental principle of immediate intervention, prophylactic and conservative, and strictly adequate to the lesion.

Articular surgery is one of the finest conquests of field surgery. It is as important that injuries of the large articulations be treated at the front as injuries of the skull, chest, and abdomen.

W. A. BRENNAN.

**Swett, P. P., and Stoll, H. F.: Hereditary Syphilis as an Etiological Factor in Spurs on the Os Calcis.** *Surg., Gynec. & Obst.*, 1916, xxii, 674.

The authors report 9 cases of spur formation on the os calcis, which seem to be the result of hereditary syphilis. Three of the cases were operated upon and after a few months the symptoms recurred. In these 3 cases, as well as in the other 6, the symptoms were finally relieved by active specific medication. The diagnosis of hereditary syphilis is based on an extensive study of the family histories, and in 7 of the cases the presence of the spurs was shown by X-ray pictures. In all of the cases the Wassermann reactions were negative.

From this study it is concluded, in view of the suggestive family histories and the marked improvement in the local symptoms as well as in the general health, that hereditary syphilis is an underlying etiological factor of great importance in many cases of spur formation on the os calcis. Also it seems that the pain in these cases results from an active inflammatory process, and that the spurs themselves are not necessarily painful, unless they are of such a size or in such a position as to cause pressure on surrounding tissues.

### FRACTURES AND DISLOCATIONS

**Pozzi, S., and Peuret, A.: Treatment of Fractures of the Thigh in War Surgery** (Sur le traitement des fractures de cuisse en chirurgie de guerre). *Rev. de chir.*, 1916, xxxv, 177.

The authors report 20 cases of thigh fracture due to war injuries. Of these, 6 were due to bullets and were completely aseptic. Treatment was by immobilization and extension. Consolidation was obtained in all cases with more or less marked shortening. There were 14 cases of suppurating frac-

tures, mostly due to shells. The treatment consists in clearing of the wound; drainage; use of Dakin's solution; immobilization; daily dressings. Drainage was as free as possible and whenever there was any increase in temperature or pain, fresh drainage incisions were made.

Of the 14 cases 2 died; 2 had amputations; in 6 there was complete consolidation; 1 recovered with pseudo-arthritis; 3 are in process of recovery. One of the deaths was due to septicæmia, and the other to a severe bladder injury, the fracture progressing favorably.

W. A. BRENNAN.

**Sever, J. W.: Fracture of Tuberosities of the Tibia.** *Am. J. Orth. Surg.*, 1916, xiv, No. 5.

The author reports three cases that came under his observation which were all traumatic in origin. In such cases there is produced a condition of knock-knee and joint-strain which causes a change in the weight-bearing surface of the knee-joint. He thinks balancing of the foot and leg in proper weight-bearing lines will relieve the knock-knees and joint-strain. He quotes Jones' report of two cases, Fowler's one case, and Lange's two cases.

PHILIP LEWIN.

**Robinson, E. F.: Fracture Dislocation of the Astragalus.** *Ann. Surg., Phila.*, 1916, lxiii, 606.

The author's experience has been unsatisfactory with the older methods of treatment of fracture dislocations of the astragalus and he has found that the recipient was more or less of a cripple the remainder of his life.

In the case reported he shows an excellent result attained by open operation after the usual manipulation under anæsthetic proved of no avail. An incision four inches over the outer side of the ankle was made, the fragment pried into place, the wound closed without drainage and the plaster cast applied. An excellent result was obtained.

H. W. MEYERDING.

**Cotton, F. J., and Henderson, F. F.: Results of Fractures of the Os Calcis.** *Am. J. Orth. Surg.*, 1916, xiv, 290.

The authors report the results obtained in 75 cases. The great majority were "smashes" of the os calcis received in falls on one or both heels from a height of from 5 to 40 feet. In general there was a "smash" below the weight-bearing vertical line of the tibia, running more or less, mostly less, vertically, and various radiating lines running down and forward and backward. The heel was driven up and often was driven outward. The whole bone was compressed vertically and expanded laterally; there was often a pushing of fragments inward under the ankle, and almost uniformly a considerable pushing outward of bone-fragments, capped by the usually intact outer lamella of the os calcis out under the external malleolus.

The authors believe that os-calcis fracture of the usual compression type is one of the most serious

lesions met with, so far as future function is concerned. The prognosis as to use is as serious as fracture of the femur at the hip.

Late operations for correction are useful, but far from ideal in results. Palliative measures (plates, pads, braces, and shoe modifications) are usually useless. The authors recommend the Cotton reduction as outlined in 1908.

PHILIP LEWIN.

**Lounsbury, B. F.: Fracture of Os Calcis.** *Surg., Gynec. & Obst.*, 1916, xxii, 638.

Fracture of the os calcis has been considered a rare condition. Recent statistics show that it forms about 2 per cent of all fractures. In the past the condition has been largely unrecognized and treatment neglected. Diagnosis without X-ray examination is difficult. The cardinal points in diagnosis are:

1. History of injury (usually a fall from a height, landing on the feet).
2. Physical findings:
  - (a) Heel broadened and everted.
  - (b) Absence of concavity on both sides of Achilles tendon.
  - (c) Sinking of malleoli, especially the internal one.
  - (d) Flattening of the longitudinal arch of the foot.
  - (e) Ecchymosis.
  - (f) Sometimes, crepitation.
3. Pain.
  - A. In old cases.
    - (1) Across front of instep.
    - (2) Under point of heel.
    - (3) Under external malleolus.
    - (4) In sole of foot.
  - B. In recent cases.
    - (1) Diffused pain through heel and ankle aggravated by attempt to stand on foot, or by manipulation.
4. Radiogram.

No case of ankle injury should be finally diagnosed without this means.

Usually more than one line of fracture exists. Most frequently fracture begins in the concave articular facet of the os calcis where it articulates with the wedge-like articular facet of the astragalus. The portion of bone posterior to this point is usually driven upward and backward, either in a single mass or broken by one or more lines. Usually there is considerable impaction. This displacement backward and upward produces flattening of the longitudinal arch of the foot. The fracture may be comminuted and occasionally may be compound. There may be a tear fracture at the insertion of the Achilles tendon, or of the plantar tendon, or on the lateral aspect at the attachment of the calcaneofibular or lateral talocalcaneal ligament. There may be a simple line of fracture without displacement.

The results of treatment of this condition in the past have been poor. The condition is usually un-



recognized and neglected. In old cases palliative treatment is adopted, such as arch supports for fallen instep, pads under the heel for pain in the sole of the foot, or operative procedures to remove spicules and projecting callus. In recent cases the normal contour of the bone should be restored. For tear fractures, the fragments are sutured in position. Cases with backward and upward displacement of the posterior fragment (and these form a large majority of fractures of the os calcis) are reduced by passing a urethal sound in front of the Achilles tendon, making strong downward traction while counter upward pressure is made on the anterior end of the bone in the sole of the foot. The fragments are held in position by severing the Achilles tendon and incasing all in a plaster cast to the knee. While the cast is hardening the ball and heel of the foot are pulled toward each other, making a high elevation in the arch of the foot. The cast is kept on for four weeks, then removed and passive motion and massage used daily, with hot foot soaks. The patient should be kept off his feet for ten weeks, then arch supports are fitted in the shoes and he is gradually permitted to put weight on the foot while walking with crutches.

The disability usually lasts six months or more in recent cases properly treated. In unrecognized and neglected cases the disability lasts from six months to two years and may even become permanent.

**Groves, E. W. H., and Brown, T. H.: The Treatment of Gunshot Fractures.** *Lancet*, Lond., 1916, cxc, 900.

In a typical gunshot fracture the authors call attention to three main characteristics: (1) great comminution with displacement, (2) severe sepsis, and (3) pain which becomes intolerable with movement.

The indications are directed to saving life and limb and to restoring function. To accomplish these results, four things are necessary: (1) immobilization for a long period, (2) free drainage and frequent redressings, (3) extension in a correct line, (4) maintenance of both wound treatment and extension for a period which may be prolonged for several months. In addition the nearby joint should be semiflexed, so that the limb is in physiological rest, and the flexors are relaxed. Massage and movement of the limb from an early period should be practiced.

Grossly infected wounds are frequent after fracture by bombs and shell fragments, also by military rifle bullets at proximal ranges. They should be opened up freely at the earliest moment. Treatment should not be delayed for X-ray evidence if it is not at hand. Missiles and particles of clothing as well as all extraneous matter should be removed. Small punctured and penetrating wounds should be left alone with a simple dressing, until further treatment can be given in a general hospital, provided there is no evidence of infection.

In comminuted fractures, the authors state with

positiveness that however freely the wound is opened up, the bone fragments must be left *in situ*. There are only two exceptions to this rule of not removing bone fragments: (1) when the articular end of a bone is shattered, all loose bone should be removed from the joint; and (2) if a bit of bone is clearly devoid of all vascular connection and lies in a septic wound, it should be taken out.

Operative fixation of fragments is not recommended. If much comminution is present, plating or wiring is useless and a mechanical impossibility, and when the fracture is not comminuted, it should be treated by extension. Boring bone for plating invariably leads to necrosis when the wound is already infected.

A very good description is given of the latest and best apparatus made of wire, which is easily transported in the field, as well as a careful description of the technique in the practice of immobilization.

LOUIS A. LAGARDE.

**Darrach, W.: A Plea for the Immediate Reduction of Fractures.** *Ann. Surg.*, Phila., 1916, lxi, 593.

The author believes the old dictum, "Wait until the swelling goes down," has been the cause of much permanent disability and deformity, and that fracture with displacement should be considered as much an emergency as acute appendicitis or perforating ulcer. One should preferably have an X-ray first to assist in making an exact diagnosis, but if not available, manipulation is indicated without, as early reduction is desirable and of sufficient advantage to offset the value of X-ray.

Open operation should be deferred until nature has had an opportunity to marshal her forces and resistance and get the injured area entrenched behind a zone of infiltration.

Immediate reduction of fractures with displacement results in easier and more accurate apposition, less pain, less swelling, less reparative tissue formation and a more rapid, solid, bony union.

H. W. MEYERDING.

**Gallie, W. E.: Open Operation for Fractures.** *Canad. J. Med. & Surg.*, 1916, xxxix, 163.

Gallie in his article makes a plea for the use of boiled bone for plating fractures. His experiments show conclusively that when any form of transplant is used, death of the transplant follows with subsequent replacement of the dead bone by new formed bone which is deposited along the ingrowing capillaries. Since this is true the author believes that boiled bone plate can be used more successfully than autogenous grafts, as they can be prepared beforehand.

Gallie uses a plate made from beef bone curved in transverse section and thicker in the middle than elsewhere. For fastening the plate screws of bone are used, these are cut on a lathe. In cutting the hole for the screw a tap smaller than the screw is used, into the thread thus cut a polished steel screw is driven, this cuts a thread and hardens it by com-



pression so that when the bone screw is put in it does not crumble.

When the bone screw is turned a short stem is left attached to the head, this is tapered and squared to fit into a chuck made like a clock key by which the screw is driven home. The stem is turned down thin at its junction with the head so that it can be broken off after the screw is in place.

Gallie also describes a bone holding clamp for retaining the fragments in place, this can be better appreciated by reading the original article.

FRANK D. DICKSON.

#### SURGERY OF THE BONES, JOINTS, ETC.

**Walther, C.: Repair of a Breach of the Trapezius and Splenius with a Cicatrix Adhering to the Cervical Vertebrae** (Réparation d'une brèche du trapéze et du splenius avec cicatrice adhérente à la colonne cervicale). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 585.

The patient reported by Walther was injured by a gunshot and showed a deep cicatrix about the size of a five-franc piece adhering to the cervical vertebrae at the crest of the left half of the sixth and seventh cervical vertebrae. The trapezius, splenius, and first layers of the rhomboid had been sectioned by the projectile.

It was impossible to elevate the shoulder, and pain radiated along the spine. Walther excised the cicatrix, freshened the muscles and sutured them which not only resulted in the correction of the deformity, but left a condition which, as far as contracture was concerned, did not differ from the opposite side.

W. A. BRENNAN.

**Linberger: Hypodermatic Treatment of Joint Injuries** (Ueber Stauungsbehandlung bei Gelenkverletzungen). *Muenchen. med. Wchnschr.*, 1916, lxiii, 331.

Linberger reports the details of 8 cases of severe injuries of the knee-joint treated by Bier's method of continuous hyperæmia which was found practicable in field surgery and requires no more time than other procedures for severe wounds. Of the 8 cases 7 were cured.

This method is particularly useful in knee-joint gunshot injuries which are almost always infected wounds. It obviates and checks the results of infection and thus renders major operations unnecessary. Fever abates soon after the beginning of treatment and pain is usually decreased within twenty-four to thirty-six hours. The end functional results were good.

W. A. BRENNAN.

**Mouchet, A.: Treatment of Fistulous Osteitis by the Polyvalent Serum of Leclainche and Vallée** (Le traitement des ostéites fistuleuses par le sérum polyvalent de Leclainche et Vallée). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 898.

The author reports the moderately satisfactory results which he has observed in the treatment of fistulous osteitis by the serum of Leclainche and Vallée. The use of this method offers doubtful advantages and may occasion great danger.

The author believes that the majority of osteites should be treated surgically. The mechanical action of the serum which would aid in the elimination of the sequestræ is manifested only when no surgical treatment has been instituted.

The cicatrization obtained after the use of serumized dressings is not always durable. Serotherapy does not always suffice to bring about recovery, and then surgical interference has to be adopted under the least favorable conditions. Moreover, the employment of the serum may give rise to accidents, lymphangitis, erysipelas, and abundant and fetid suppurations from the tract of the osteitis.

Serum may be of use in the treatment of the soft parts and in cases of superficial osteitis but it should be used with extreme caution. W. A. BRENNAN.

**Armitage, H. M., and G. L., Jr.: Treatment of Injuries in the Vicinity of the Elbow-Joint.** *Ann. Surg.*, Phila., 1916, lxiii, 596.

The authors review the anatomy of the elbow-joint and call attention to the gravity and frequency of injuries in this region. They divide elbow-joint injuries into:

1. Fractures of the lower end of the humerus: (1) supracondyloid fracture (more or less transverse of the shaft above the condyles); (2) T- or V-shaped fractures; (3) epiphyseal separation; (4) fractures of the external or internal condyles and epicondyles.

2. Lesions of the radius and ulna: (1) dislocation backward of the radius and ulna; (2) fracture of the upper third of the ulna, with or without dislocation forward of the radius; (3) dislocation forward of the upper end of the radius; (4) fracture of the olecranon process of the ulna; (5) fracture of the neck or head of the radius; (6) subluxation of the head of the radius; (7) fracture of the coronoid process of the ulna.

3. Simple sprains of the elbow.

Treatment and surgery of these conditions are discussed. Attention is called to the fact that frequently dressings are responsible for stiffness following joint injuries, and that the best results are obtained by dressings in acute flexion as soon as the acute symptoms have subsided, during which time they are dressed in extension. Passive motion is advised when due to prolonged immobilization, adhesions, etc., though many able authorities advise to the contrary.

Ankylosis due to excessive callus or displaced fragments demand operation and massage. The use of splints, etc., is advised against.

H. W. MEYERDING.

**Hardouin, P.: Resections of the Elbow in War Surgery; Functional End-Results** (Observations de résections du coude en chirurgie de guerre; résultats fonctionnels éloignés). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1162.

The 51 elbow resections reported by Hardouin are divided into 3 groups: (1) primitive resections



(within 24 hours), 19; (2) secondary resections with drainage, 25; (3) late secondary orthopedic resections, 7.

The first group gave the worst results. In 9 cases there was no voluntary improvement; 5 are ankylosed; 2 semi-ankylosed; 3 with limited flexion.

The second group gave 3 good results with extended strong movement; 4 with limited flexion; 7 ankyloses (5 with half extension or somewhat more, 2 with bad extension); 6 with no spontaneous movement; 5 with defective flexion. Of the 25 cases 7 arms are good or fairly good; 5 are ankylosed, and in 13 the arm can give no real service.

In the third group, among the 7 cases, 4 showed good results, 1 moderate, and 2 bad.

Despite the poor functional results the author thinks that resection of the elbow with drainage is an operation of necessity when the life of the patient or the limb is endangered.

W. A. BRENNAN.

**Legg, A. T., and Ober, F. R.: Tendon-Transplantation.** *Interst. M. J.*, 1916, xxiii, 333.

The author's present conclusions are drawn from 100 cases of tendon-transplantation at the Children's Hospital, Boston, during the five years previous to 1914. Transplantations at the ankle alone were considered.

Under general considerations the authors call attention to the proper muscle balance being sustained following transplantation; the inadvisability of waiting too long, probably two years after the disease would be best because of the weakness following fixation, etc., with braces. Actual paralysis must be determined as muscles may appear to be paralyzed but are only apparently so from overstretching, etc. Leverage and mechanical possibility must be considered.

Operative considerations favor correction of deformity, first, the tendon-transplantation making the wound away from the course of the tendon and inserting it well into the bone after passing under fascia, fat, and annular ligaments. Insertion without tension and careful closure of the tissue overlying the tendon are advised to prevent adhesions.

Post-operative treatment consists of plaster of Paris in an overcorrected position, light massage at the end of three weeks, wearing of a plaster cast for three months, and a brace two to four months.

Causes of failure are faulty technique, poor selection of cases, and inefficient after-care. Too long wearing of braces is warned against. Six months' time is sufficient.

H. W. MEYERDING.

**Jones, R.: Notes on Military Orthopedics; Suture of Nerves, and Alternative Methods of Treatment by Transplantation of Tendon.** *Brit. M. J.*, 1916, i, 641, 679.

The author calls attention to the proper treatment of nerve injuries causing limb disability. His wide experience before and during the war make his observations most valuable. In his opening paragraph he dwells upon the orthopedic features in the

treatment of nerve injuries, as nerve injuries rarely occur without damage to the surrounding structures — bone, tendon, muscle, and skin.

In suture of the nerves, the following points should be observed:

1. The correction of contracture of the skin or muscle, and all the anatomical constituents from the skin to the bone on the concave aspect, that is to say, on the abnormal direction the contracture takes.

2. When possible the freeing of joints from all adhesions and the restoration of the mobility of the joint in all cases where ankylosis of the joint is threatened.

3. The maintenance of the paralyzed muscles in a position of relaxation throughout the period of recovery.

4. The practice of massage during recovery, but without once allowing the relaxed muscle to be stretched.

He lays especial stress upon the relaxation of the muscle and has found that this elemental principle is often neglected. He says: "the most skillful operation performed on the most suitable case will prove a fiasco unless the affected muscles are kept continuously relaxed until recovery takes place."

He recalls his previous statement that though poliomyelitis may permanently destroy the motor-cells of the anterior horns of the gray matter, and thus forever render the muscles dependent upon them useless, this however has seldom been the case and clinical experience has shown complete paralysis with complete recovery and many partial recoveries, thus proving that the motor-cells thus concerned suffered only temporary injury.

The difference between an overstretched and a paralyzed muscle must be recognized, and this can only be done by putting it in a position of relaxation and giving it prolonged rest for at least six months. Although many of the principles are applicable to gunshot wounds, there is a limit to conservative methods, and in cases presenting a promise of success nerve-suture is advised. The author states that his experience in tendon-transplantation in poliomyelitis has been of great value to him in caring for gunshot wounds.

H. W. MEYERDING.

**Quénu, E.: Partial Amputations of the Foot for Gunshot Wounds of War** (Note sur les amputations partielles du pied dans les plaies par projectiles de guerre). *Bull. et mèm. Soc. de chir. de Par.*, 1916, xlii, 538.

Injuries to the foot by gunshot wounds are comparatively rare. In the statistics of Nové-Josseland, Gourdon, and others, in 2,516 amputations there were only 110 partial amputations of the foot, and a great many of these were on account of frostbite.

Quénu thinks that in injuries to the foot, as in those of the hand, even when the injury is severe, there should be no haste to amputate; and when amputation is necessary it should be done in healthy

tissue. If there is no appearance of infection, the general rules of surgery should be followed; i. e., removal of the projectile and cleansing the wound. If the operation is done early, with arrest of the projectile in the tissues, reunion by first intention may be obtained even in articular wounds with a rapid cicatrization and a return of the functions of the foot. If there is infection and the joints are suppurative, the phlegmonous foci must be incised and evacuated. If drainage of the articulation is difficult amputation may have to be done; but this should be confined to plane section in the infected articulation.

The final plastic restoration should be delayed for several weeks when the field of operation is in a generally healthy condition. This will give opportunity for an economic operation. As much of the calcaneum as possible should be preserved.

Pirogoff's operation, either modified or not, appears to be the most desirable. W. A. BRENNAN.

### ORTHOPEDICS IN GENERAL

**Painter, C. F.: Hallux Valgus.** *Boston M. & S. J.*, 1916, clxxiv, 636.

The etiology and treatment of hallux valgus is here taken up. Hallux valgus is merely an outward deviation of the great toe, accompanied usually by bursa-formation, and more or less painful and disabling static disturbances.

Hallux valgus is nearly always accompanied by a relaxed anterior arch with its flat forefoot, callus formation, and general discomfort. It is essentially a shoe deformity, short and pointed shoes giving the greatest number of cases.

Pathologically hallux valgus is not an exostosis at all, shows no thickening of the metatarsal or

phalanx, but does exhibit an atrophy or erosion of the articulating head of the metatarsal.

For operative treatment, Painter recommends the old Hueter operation, removing the metatarsal head, and advises the use of a metal splint to prevent riding up of the phalanx on the metatarsal. He condemns the use of turning in the bursa between the metatarsal and phalanx. R. G. PACKARD.

**Cross, C.: Golfer's Foot.** *Med. Rec.*, 1916, lxxxix, 896.

Golfer's foot is a new name for the old condition of metatarsalgia and, as defined by Cross, is a distortion downward of the heads of the second, third, and fourth metatarsals or any one of them. In the golfer this condition is due to the fact that when making for instance a right-handed drive, the player throws most of the body weight over the anterior portion of the left foot, for the foot has been elevated with the "upswing." This weight is distributed mostly to the outer half of the arch, including the third, fourth, and fifth metatarsal heads, and a strain may be produced. This condition of relaxation or rupture of the ligaments of the anterior metatarsal arch, may also occur in any overused foot.

The symptoms include first a slight discomfort at the base of the third or fourth toe, slight swelling on the dorsal surface, pain on pressure, and a feeling of irritability or fatigue. Physical signs are practically negative. Treatment consists in correcting the arch by the application of dry heat, holding up the arch by some flexible support, exercising the feet nightly, and reducing the acute inflammation by a wet dressing of magnesium sulphate. The patient should turn his toes in more, should not change suddenly from high to low heels, and should wear shoes not too short. R. G. PACKARD.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Castex, M. R.: Vertebral Metastatic Carcinoma Primary in the Breast** (Carcinosis vertébral metastatica por primitivo de la mama). *Prensa méd.*, Argent., 1916, ii, Supp., 213.

The author reports a case in a woman of 42. The history showed that in October, 1915, the left breast had been excised on account of a tumor. Examination in February, 1916, showed the vertebral column grossly deformed: dorsolumbar kyphosis; movements of extension, flexion and latero-flexion, considerably reduced and painful; pressure very painful from the second dorsal to the sacrum; apophyseal deviation in all the zone of the kyphosis; intense intumescence on both sides of the column in the dorsolumbar zone, bland, elastic, and very painful.

Three possible genetic causes for the spondylosis, lues, tuberculosis, or neoplasm, are considered. The first two Castex rules out for reasons given and

deduced from the symptomatology. He thinks the mode of onset, the morbid course, and the actual symptoms fully correspond to a vertebral carcinoma process. The fact that the patient had already had a neoplasm of the left breast is significant; and although it may be objected that the spondylosis might have existed prior to the neoplasm, yet the author thinks the facts in the history clearly prove that this was not the case.

Vertebral carcinoma is never primary; it is always secondary or metastatic. The observations on record of primary carcinoma do not stand before anatomopathologic criticism and they are all shown to be endotheliomata or primary sarcomata. Vertebral metastatic cancer always corresponds to the primary type from the histological viewpoint. It is much more frequent in women than in men, and corresponds with cases of mammary carcinoma. The author is aware of only one case of vertebral



carcinoma in which the uterus was the prime focus. In similar cases in man the prime focus is in the prostate or bronchii.

The point of incidence in the vertebral body is usually the spongy tissue and it develops most commonly into osteoclastic carcinoma, but it may take the osteoplastic form. The dorsal and lumbar regions are the most frequently attacked and the process usually extends to many vertebræ.

The author points out that a woman operated upon for a mammary cancer may, months or years later, show nervous phenomena which are a consequence of the primary neoplasm. He refers to such cases and he thinks that the pathology of vertebral carcinoma can explain all the spondylitic phenomena.

The prognosis in this as in other advanced cases is fatal. No reliance can be placed on arsenicals, radio-activity, or colloidal preparations which have always failed in such a condition. W. A. BRENNAN.

**Schachner, A.: Injuries of the Spinal Cord; with Report of Gunshot Injury of the Cord at the Fourth Cervical Vertebra and Successful Removal of Projectile.** *Surg., Gynec. & Obst.*, 1916, xxii, 706.

The case reported was that of a boy shot with a 22-calibre long projectile fired from a rifle. It lodged in the posterior columns of the cord and was successfully removed from the cord at the level of the fourth cervical vertebræ. In this paper, dealing with injuries of the spinal cord, the author emphasizes the following points:

While a carefully prepared set of radiographs, stereoptically studied, will supply valuable data as to the course of the projectile and the probable nature of the spinal injury, from which valuable con-

clusions as to the possible existence and probable extent of cord injuries can be drawn, it is pardonable to emphasize the warning that the diagnosis, however carefully made, is frequently misleading.

The term "concussion of the cord" is one about which there is considerable difference of opinion, it being accepted by some and rejected by others. The term may be said to mean the impairment or loss of function without the existence of gross anatomic cord changes.

If a hæmatorrhachis is suspected, a lumbar puncture will confirm the existence of the same as well as relieve the pressure within the space, if it is done early.

Hæmatomyelia, as a pathological entity, is of comparatively recent origin, and according to Thorburn and others is underestimated as to its frequency. Hæmorrhage selects the gray matter of the cord over the white, because the vessels are less firmly supported in the gray matter. As the gray matter is most predominant in the cervical region it is the most favorable region for its occurrence.

The Roentgen ray spinal puncture, and a careful, neurological study, is the diagnostic triad upon which we are dependent.

It is difficult to avoid the conclusion that an accurate estimate of the cord destruction is frequently impossible, and if this fairly represents the status is it not proper to lay down the axiom, "When in doubt, explore"?

If modern surgery can lay claim to any achievement, it is the elimination of doubt through cautious exploration, and the fact that some explorations can be shown to be useless, or even a few fatal, does not, in the author's judgment, invalidate the broad application of the rule.

## SURGERY OF THE NERVOUS SYSTEM

**Sicard, J. A., and Dambrin, C.: Nerve-Sutures (Sutures nerveuses).** *Bull. et mém. Soc. de chir. de Par.*, 1916, xxxii, 961.

In reviewing the observed cases of nerve-suture for the past 15 months, it appears that the classic techniques followed have not fulfilled the expectations held out and that other operatory methods must be sought to give better results.

Experimental operatory interventions made prior to the war — clear sections with a minimum of suppuration — are very different from those met with resulting from projectiles. The lesion is more extended; fusion is distant in the nerve-trunk; the cicatrix is hard and retractable, formed at the expense of tissue a long time suppurative; and it may even be fibrous or cartilaginous in consistency. The operator may attempt a partial resection and endeavor to make an end-to-end suture of such altered tissues, which is sure to be a thera-

peutic failure; or if a large resection is attempted, end-to-end suture is not utilizable. In such case suture "*par dedoublement*" may be tried but this is doomed to total failure. Unfortunately the cases are rare in which the extent of the nerve injury is so reduced that it is seen within the operatory field and that the ends may be united directly to other nerve fascicles with preservation of the surrounding nourishing tissue. This, when it happens, is the method of choice, and offers the best chances of recovery.

After having performed a large number of nerve sutures by different classic methods, the authors are led to believe that end-to-end suture after strict resection of all fibrous parts remains the best method, but that whenever such suture is impossible, the method of choice is the nerve-graft, which may be either by heterograft or autograft.

The authors describe their technique of nerve-

grafting. They have performed 11 such operations since December, 1915, but it is too early for an opinion as to the results.

Gosset, who submitted this report, stated that according to figures published in 1915 by Sicard, the actual number of cases in which the authors had performed nerve-suture was 37. There appears to have been only 1 success in the series so there was nearly 100 per cent of failures. Personally he has made 352 interventions for lesions of peripheral nerves during the war, 126 nerve-sutures, and 25

nerve-grafts. Referring only to cases before January, 1915, of 12 cases of complete interruptions, 6 were treated by resection and end-to-end suture. In all there was functional amelioration and in 5 there was a return of mobility. Of the other 6 cases 2 were treated by "*dedoublement*." In one of these there is partial restoration of motion and sensation. The other 4 cases were treated by liberation. In each case the result was nil. The end-results of some of his graft cases are encouraging and he will report on them. W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.

**Roffo, A., and Gallo, N.: Contribution to the Chemical Study of Tumors** (Contribucion al estudio del quimismo de los tumores). *Prensa. méd.*, Argent., 1916, No. 32, 378.

The experiments were carried out on rats.

In a tumor weighing 36.236 gm., the total solid substances were 14.05 per cent, while the total of water found was 85.95 per cent. The amount of protein found was 58.22 per cent of the dry substance; organic matter and minerals 23.16 per cent; neutral fats 10 per cent; phosphates 8.7 per cent; the minute rest was found composed of phosphorus and nitrogen.

From the results of careful experimentation, the authors draw the following conclusions:

1. The chemical composition of a tumor is constant.

2. The globular composition is constant and the same in carcinoma as in sarcoma, artificially produced in the rat.

RAOUL L. VIOBAN.

**Villa, G. T.: Malignant Pustule Treated by Bacelli's Method** (Un caso de pustula maligna tratado por el metodo de Bacelli). *Rep. de med. y cir.*, Bogota, 1916, vii, 304.

A small pruriginous vesicle in the left malar region of a child of 10 resisted all local treatment, including cauterization. The scar became surrounded by small pustules, there was considerable oedema, and the neck ganglia tumefied and painful.

The child was removed to the hospital, and an intravenous injection of 2 cubic centimeters of bichloride of mercury solution in artificial serum 2:1000 was made. Four milligrams of mercury were used. The treatment consisted in the use of compressions on the face and chlorate of potash gargle. Within a few days all symptoms were subsiding. When last seen there was only a scar, the oedema had disappeared, and the ganglions were no longer apparent.

W. A. BRENNAN.

**Simmonds: Cachexia of Hypophysary Origin** (Ueber Kachexie hypophysaeren Ursprungs). *Muenchen. med. Wchnschr.*, 1916, xliii, 243.

About two years ago Simmonds published the account of a case of puzzling cachexia which terminated in death, and in which the cause was deemed to be an embolic process of the hypophysis.

The case which he now reports is that of a man of 58, who for more than a year showed anæmic and other symptoms. An occult cancer was suspected. Autopsy showed that apart from a terminal pneumonia there was a hypophysary tumor, somewhat larger than a hazelnut, which had almost completely destroyed both hypophysary lobes. In the absence of other explanation, the cachexia can be explained only by the hypophysary alterations. There was no sign of acromegaly, not a single oxyphile, only the basophile adenoma of the hypophysis; polyuria and adiposis were lacking; but on the other hand genital atrophy and cessation of spermatic secretion and fall of pudendal hair were noted.

Simmonds also refers to a third case of hypophysary cachexia in a girl of 9 with a basophile adenoma of the hypophysis, a temporary polyuria being the only clinical symptoms.

W. A. BRENNAN.

### BLOOD

**Beatti, M.: Importance of the Lymphocytosis of the Blood** (Importancia de la linfocitosis de la sangre). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 54.

Beatti thinks that lymphocytosis *per se* does not call for specific treatment. In a syphilitic patient without symptoms, with the Wassermann and Nonne-Apelt reactions negative, but with lymphocytosis in the blood, nothing can be deduced from this sign. In the case of a patient without specific symptoms showing neither globulinuria, nor cellular modification in the cephalorachidian fluid, and the two Wassermann reactions negative and with lymphocytosis alone in the blood, this picture is not sufficient to affirm syphilis. W. A. BRENNAN.



**Friedmann, M.: Intravenous Continuous Infusion at the Front** (Ueber intravenoese Dauerinfusion im Felde). *Muenchen. med. Wchnschr.*, 1916, lxi, 553.

Friedmann cites Garré, Nowakowski, and others whose experience is that subcutaneous infusion of salt solution fails in war surgery at the front. His own experience is similar and he has given up that method and used continuous intravenous drip infusion for more than a year, and has obtained much better results. The method is illustrated by citing a case of severe gluteal region grenade wound, the patient blanched and almost pulseless. The cubital vein is at once opened, there being no necessity for anæsthesia. A glass cannula is sutured into the vein and the infusion dripping is regulated by means of a Martin glass ball apparatus. When the pulse is felt the drip is regulated to 200 per minute. The operation is then proceeded with.

The rate of drip is varied from 30 to 100 per minute after the operation according to the condition of the pulse, and diagen, stropanthin, or adrenalin can be added; or isotonic sugar solution may be used instead of the saline. Not more than four to five liters of water should be used in from twelve to twenty hours. W. A. BRENNAN.

**Miller, G. I.: Blood-Transfusion.** *Long Island M. J.*, 1916, x, 189.

In the hope of finding a method of performing blood-transfusion which would overcome all objections to the excellent syringe method of Lindeman, the author devised a valve, which consists of a central body, a cylinder 1.5 in. long and 0.5 in. in diameter, with two arms extending in opposite directions. On the upper surface is a thumbscrew arrangement which slides back and forth on an internal fitting, which has two grooves of the same size as the lumen in each arm. From the under surface of the central body a cylindrical stem just large enough to receive the tip of a Record syringe projects downward one inch.

The two arms are connected to pieces of 12 F. rubber tubing 3 in. long. In the distal end of each tube a metal tube is inserted, which fits the cannula and needle used for transfusion. By moving the thumbscrew back and forth the current can be directed into either arm.

To overcome difficulties encountered in handling and steadying certain cannulae on the market, the author has devised an instrument which is composed of three parts: cannula, hollow needle, and obturator. The needle and obturator fit snugly and telescope into the cannula. The obturator and cannula are of equal length, 2½ in. The hollow needle is one-half inch longer, and is slightly grooved, and bevelled to a fine point. Three-quarters of an inch from its distal end the cannula is encircled by two rings. The space between is just wide enough to receive a suture, which is temporarily placed by being passed through the

skin to hold the cannula in position, preventing it from being shoved back and forth during the aspiration and injection of blood.

The cannula, telescoped by the needle, bevelled point upward, is pushed through the skin and into the lumen of the vein for about a quarter inch, and the needle is withdrawn for a short distance to prevent puncturing the vessel wall. The cannula is then driven into the lumen of the vein until the ring on the cannula meets the skin. When blood is observed coming through the needle, the needle is withdrawn and if the cannula is not against the wall of the vein, the blood will flow freely. The obturator is then inserted and a suture passed through the skin and tied between the two rings of the cannula to prevent it from slipping. If the blood does not flow freely through the cannula it is withdrawn slowly a quarter inch or so.

With the donor and recipient cannulae in position, the operator removes the obturators and adjusts the metal tip of the rubber tubing to the cannulae, to fit snugly. A 20-ccm. Record syringe is filled with warm normal saline and air forced from both arms of the valve before adjusting it to the cannulae. The thumbscrew of the valve is then pushed in the direction of the donor's arm, the piston is drawn very slowly, and the syringe filled with blood. The thumbscrew is then changed toward the recipient's arm and the syringe emptied rapidly of blood. The operator continues to alternate the direction of the thumb screw, filling and emptying the syringe, without disconnecting it from the valve, until the desired amount of blood has been transfused.

ALBERT EHRENFRIED.

**Carter, W. S.: An Experimental Study of the Use of Sodium Citrate in the Transfusion of Blood by Direct and Indirect Methods.** *South. M. J.*, 1916, ix, 427.

Carter's experiments were upon dogs. His apparatus consisted of an ordinary pharmacist's percolator of 300 ccm. capacity. This was calibrated and a perforated rubber stopper was fitted into each end. The stopper at the bottom end had a Y-shaped glass tube, drawn out to form two cannulas, inserted into it. The upper stopper had a bent piece of glass tubing inserted into it, which served to connect the cylinder with two pressure bottles. The pressure bottles were used to control the pressure in the cylinder.

At the beginning of each transfusion 50 ccm. of a 2 per cent solution of sodium citrate was put into the cylinder and the blood was drawn in by lowering the pressure bottle. For the first and second groups a uniform negative pressure was used when filling the container, and a uniform positive pressure in emptying it. It became apparent that the most important factor was the length of time the blood was kept out of the body; so, in the third group, the blood was kept in the cylinder a uniform period of time by varying the pressure. It was found that the blood should not



be kept out of the body more than one and one-half minutes at the most.

The solution of sodium citrate was compared with physiological salt solution, with Ringer's solution, and with a solution of hirudin.

In the experiments in which sodium citrate was used in the indirect method, the blood was allowed to flow through a paraffined cannula into a flask containing 25 ccm. of 2 per cent sodium citrate solution until the flask was filled up to the 250 ccm. mark. The citrated blood was filtered through several layers of sterile gauze wet with physiological salt solution before it was introduced into the recipient's vein. Small clots were frequently found on the gauze showing the necessity for this precaution.

It was found to be very important to have a cannula large enough to give a free flow from the donor, thus avoiding delayed coagulation which occurred in the citrated blood after it had been filtered through gauze in three cases in which the flow was slow.

In Carter's experiments he found:

1. That sodium citrate is a satisfactory anti-coagulant when used in the cylinder for direct transfusion in a 2 per cent solution.

2. That transfusion can be continued from 2.5 to 3 times longer with a 2 per cent citrate solution than with a physiological solution.

3. That a solution of sodium citrate is as efficient as a solution of hirudin, as shown by the amount of blood transfused or by the time of transfusion.

4. That sodium citrate does not lessen the coagulability of the blood and is not toxic in the amount used.

5. That the coagulability of the blood is temporarily increased immediately after transfusion in which sodium citrate is used.

6. That the lethal dose of sodium citrate in dogs is about 1 gram per kilogram of body weight when dilute solutions are injected and that in concentrated solution the dose is not more than 0.5 gram per kilogram.

7. That a 0.2 or 0.3 per cent solution of sodium citrate is sufficient to prevent coagulation and does not have any toxic effect in the amount used for indirect transfusion in man. J. W. TURNER.

#### BLOOD AND LYMPH VESSELS

**Soubbotitch, V.: Traumatic Aneurisms** (Aneurisms traumatiques). *Bull. et mèm. Soc. de chir. de Par.*, 1916, xlii, 698.

Soubbotitch of Belgrade gives details of vascular surgery performed by him during the Serbian wars of 1912 and 1913 and also during the present war.

In all the author has operated upon 169 cases of traumatic aneurism. The details of 43 of these were left behind on the retreat of the Serbian Army from Nish, and these, if available, will be published later. The present report therefore deals with 126 operated cases only. In these 161 important vessels were injured, 129 arteries and 32 veins.

The operations in the 161 comprised 107 ligatures—93 arteries, 14 veins; 50 angiorrhaphies—32 arteries, 18 veins—29 being partial and 21 total; 4 Matas operations (aneurismorrhaphy).

The operative results are as follows:

In 72 arterial aneurisms treated by ligature, there were 56 recoveries; 1 improved; 8 cases of gangrene; 8 deaths.

In 18 arteriovenous aneurisms treated by ligature there were 14 recoveries, 1 case of gangrene, 3 deaths.

In 23 arteriorrhaphies for aneurisms there were 18 recoveries, 5 failures of which 1 died.

Of 19 arteriorrhaphies for arteriovenous aneurisms, there were 15 recoveries, 2 deaths, 1 failure, and 1 unknown.

Of 4 Matas operations 4 recovered.

Post-operative gangrene developed in 10 cases. In 9 of these amputation was performed and the cases all recovered. Amputation was refused in the tenth case. Of the gangrene cases 8 occurred after ligature, 2 after suture.

In all there were 13 deaths, 9 after ligatures and 4 after suture. The causes of death were anæmia, 4 cases; secondary hæmorrhage, 3 cases; pneumonia, 2 cases; septicæmia, 1 case; embolism, etc., 3 cases.

The full details are given in the tabular statements.

As regards the Carrel operation (angiorrhaphy) in war, the author says that owing to insufficient experience with it they soon came to the conclusion that in order that this operation should be successful the case must be aseptic. In his opinion, the Matas operation is an excellent one and to be recommended. Finally, he states that experience shows that the plasticity of the healthy and non-infected vascular walls is much greater than is believed and that an injury well endothelionized can often be sutured without freshening. Such a suture can offer a guarantee against secondary hæmorrhage.

W. A. BRENNAN.

**Begouin, P., and Moulinier, R.: Arteriovenous Aneurism of the Axillary Artery** (Anéurysme artério-veineux de l'artère axillaire). *J. de méd. de Bordeaux*, 1916, lxxxvii, 76.

The patient in this case was wounded early in August. By November 22, the date of the operation, the aneurism had the aspect of a fusiform mass occupying the summit of the axilla; was pulsatile and had a double bruit which was propagated in the pectoral region. The hand was cold, discolored, and slightly œdematous. The operation was long and tedious. The artery and vein were ligated above and below the aneurism prior to its excision. The compression of the subclavian artery on the first rib did not interrupt the arterial flow. After incising, the pectoralis major and axillary artery were temporarily ligated. The aneurism included 3 cm. of artery and 6 cm. of vein. After excision the circulation was re-established in the limb in better mechanical condition than before the operation.



Attention is called to what the authors term the collateral sign, i.e., when the circulation has attained a certain value, examination of the collateral vessels will disclose very clear pulsations over ordinarily non-pulsatile arteries. In this case the external mammary and the subscapular arteries were distinctly pulsatile. This sign, when observed, is a valuable indication for intervention and it is a symptom which argues well for a favorable prognosis.

W. A. BRENNAN.

**Séjournet: Wounds of Veins** (Plaies des veines). *Presse méd.*, 1916, p. 151.

Séjournet does not favor compression in wounds of veins because it does not assure drainage and favors infection of the wound while allowing the risk of a secondary hæmorrhage. He thinks ligature of a large vessel, by bringing the return circulation to an abrupt stop in a limb exposed to infection, compromises its vitality. Hence his preference is for lateral suture which only narrows the caliber slightly and re-establishes the circulation.

W. A. BRENNAN.

**Graf, P.: Experience with Vascular Injuries** (Erfahrungen bei Gefaessverletzungen). *Beitr. z. klin. Chir.*, 1916, xcvi, 532.

The author gives his experiences derived from 58 vascular wounds observed during the fighting around Warsaw.

In these 58 cases, 62 interventions were made: three times arrest of hæmorrhage in dying men; 43 ligatures; 5 amputations of limbs; 8 suturings; 3 tamponings under narcosis. The general mortality was 25 per cent. The carotid externa was ligated six times, the carotid interna once, and the maxillaris externa twice. Tamponade was absolutely necessary in one case. There were 15 ligatures and 3 suturings of the subclavian, brachialis, and cubitalis for arm wounds.

In the leg region 30 interventions were made for 29 injuries; 23 ligatures — 5 amputations for infection; 5 vessel suturings; 2 tamponades under narcosis. Of these interventions, 16 were on the femoralis — 11 ligatures, 6 suturings. In 4 out of 5 interventions on the popliteal, infection was already manifest, and in the fifth case the patient died of secondary hæmorrhage after a couple of weeks. In the tibialis, ligature generally stopped the hæmorrhage. In one of these cases amputation was found necessary and the patient died after a few days owing to loss of blood from the stump.

Eight arterial suturings were done without any subsequent secondary hæmorrhage, infection, or death. The author's experience leads him to think that vascular injuries coming to the field surgeon are under all circumstances to be considered as life endangering. In only the minority can a smooth, infection-free encapsulation of the blood outlet be obtained; and by the development of aneurisms bleeding may continue for weeks. Every secondary hæmorrhage, even if slight, makes an

opening up of the bullet tract imperative. This should be done even if the bleeding ceases. Later hæmorrhages may be expected with certainty. Therefore it is always best under narcosis to lay bare the larger vessels in suspected, and particularly in infected, cases.

For clean wounds suture of the vessels is the best procedure; and even slightly infected cases may be sutured, when the external wound is well trimmed. The vessel must be clearly separated away from the cavity by muscle-suturing.

Ligature of the larger vessels must be kept up for two or three weeks, especially when the collateral blood flow can be regulated and checked by a proper disposition of the limb.

Hyperæmia and the procedure of Moszkowicz are adaptable when there is a question of the development of collateral circulation.

W. A. BRENNAN.

## POISONS

**Bazy: Localized Tetanus** (Du tétanus localisé). *Bull. Acad. de méd. de Par.*, 1916, lxxv, 594.

When tetanus develops it usually attacks the whole muscular system. But some cases have been noted in which it has attacked only one part of the body, leaving the head free. This type has been designated as localized tetanus.

The author has found a case which he believes answers this description in a soldier who had the left leg amputated. Antitetanic serum was injected six hours after injury. The wound suppurated and there was some fever. All the usual symptoms of tetanus developed, trismus, dysphagia, sardonic laughter, pain, fever, and profuse perspiration, and antitetanic treatment was instituted with an immediate cessation of most of the symptoms. Bacterial cultures showed the pyocyaneus only, and inoculation proved negative. No tetanus spores were discovered.

The author, while admitting the possibility of local tetanus, thinks it is difficult to diagnose as tetanus these cases in which more or less extensive contractures are observed with a particularly painful infected wound.

W. A. BRENNAN.

**Goadby, K.: The Treatment of Tetanus.** *Practitioner*, Lond., 1916, xcvi, 526.

The treatment of tetanus is divisible into two main categories, prophylactic treatment and curative treatment.

The prophylactic treatment aims to accomplish three cardinal points: (1) to prevent the growth of the tetanus bacillus in the wound itself; (2) to neutralize any poison formed by the organism directly it is formed and before it can attack the nerve tissues; (3) to cause as little local disturbance as possible to the parts infected by the tetanus organism, especially nerve-trunks.

1. To prevent the growth of the tetanus bacillus it must be always kept in mind that the organism

is a strict anaerobe, and therefore free oxygen prevents its development. Wounds contaminated with earth, especially contused, punctured, or lacerated wounds, should be freely exposed to the air, protected only by very thin coverings. Oxygen in the form of peroxide of hydrogen should be used freely and waste dressings must be burned at once.

2. To neutralize any poison formed before it becomes absorbed by the nerve tissue, a prophylactic dose of antitetanus serum should be given as soon as practicable after the injury and before any extensive wound cleaning is performed. It should be administered subcutaneously, in a dose of 500 U. S. A. units. Since this procedure has been adopted, very few cases of tetanus have been recorded from the front.

3. Adequate and convincing experiments have proved that the tetanus toxin finds its way along the perineural lymph-channels into the central nervous system. As little local disturbance of the wound as possible is therefore indicated if any premonitory symptoms of tetanus have appeared, such as rigidity or local spasm of muscles in the immediate neighborhood of the wound, or an occasional symptom, general rheumatic pains. When definite tetanic symptoms have appeared it is highly dangerous to amputate or perform any operation which opens up the nerve-trunks anywhere near the wound.

The chief points in the treatment of established tetanus are:

1. The early recognition of the prodromal symptoms. Lockjaw is nearly always a late symptom.

2. To neutralize the poison in the nerves and blood stream, and to extract such as has already become absorbed by the central nervous system.

3. To keep the patient's strength up until the neutralization of the poison is effected by the natural defensive powers of the body, aided by the administration of the appropriate antidotes.

Chief among the early symptoms are local muscular rigidity and fibrillar twitchings; sometimes the latter are noticed by the patient himself. In a severe and extensive wound, rigidity, due to tetanus spasm, may be mistaken for traumatic swelling, but the rigidity in tetanus is usually confined to muscle groups, such, for instance, as the right half of the anterior abdominal wall in a wound of the right groin, the left rectus and the external oblique being flaccid; the deltoid and triceps in a wound of the upper arm.

The most important clinical treatment of tetanus is the administration of the specific antitoxin. The researches of Park and Biggs have shown the value of the intrathecal route for the administration of tetanus antiserum.

There is little advantage in administering tetanus antitoxin intravenously as well as intrathecally, and from Parks' experiments it appears doubtful if tetanus antitoxin enters the cerebrospinal fluid from the blood. When tetanic spasms are established,

intrathecal injection of tetanus antitoxin should be performed.

Fifteen to twenty ccm. of cerebrospinal fluid are drawn off, and the serum, previously warmed to body temperature, is slowly run in by gravity, 4,000 to 8,000 U. S. A. units, according to the severity of the case.

The patient must be kept in a darkened room, and the utmost quiet maintained. Any shock or noise, however slight, induces a spasm. Narcotics, in full doses, should be freely administered, such as chloral, 30 gr., potassium bromide, 15 gr., every four hours, until the spasms decrease; paraldehyde may be given in alternation. Morphia may be given in addition to the above.

J. H. SKILES.

**Kuemmell: The Result of Prophylactic Vaccination Against Tetanus** (Die Erfolge der Schutzimpfung gegen Wundstarrkrampf). *Berl. klin. Wchnschr.*, 1916, liii, 414.

Kuemmell dwells on the conservative course followed by surgeons in the early part of the war, and the changes which were instituted owing to the appearance about September, 1914, of gas phlegmon and tetanus. Very little success was obtained in the treatment of tetanus and the mortality was very high. Madelung showed 14 dead out of 21 tetanus cases. In different hospitals it ran from 50 to 100 per cent. However, since the wounded have been given a prophylactic intramuscular injection of 20 units of antitoxin, tetanus has almost disappeared. Inquiries show that in one hospital out of 483 prophylactically vaccinated cases there was only one death. In one of Kuemmell's field hospitals where there were 372 wounds of a severe nature, due to grenades or shrapnel, after antitoxin vaccination no case of tetanus developed.

Out of 1,555 very severely wounded cases treated prophylactically, there was only one tetanus case which was fatal. From inquiries among his colleagues, Kuemmell finds that only 42 cases of tetanus were known to have developed during the past ten to eleven months although the conditions were the same as before except for the prophylactic treatment. Of these 42 cases 29 had not received prophylactic vaccine. Among 8 French prisoners whom Kuemmell vaccinated from six to eight days after they were wounded, there were 4 deaths from tetanus.

In a good many of the cases that have been reported where tetanus appeared after the administration of antitoxin, the antitoxin was given very late. Protection can only be counted on for fifteen days, and if the infection is severe for no more than a week. The first protective vaccination must be repeated within seven days if surgical intervention of any kind is made or to be made. If there are further interventions it is well to repeat the precautionary injection. Kuemmell thinks that the relatively small number of failures after protective



inoculation will be reduced with the perfecting of the serum inoculation technique and avoidance of errors in its administration, as well as the early treatment of all suspected cases.

There is only a comparatively small number of individuals who are especially susceptible to the tetanus poison, and for whom prophylactic treatment is of little avail. For the treatment of tetanus itself, no good results follow any known treatment, and thus the practice must be to immunize the body against the working of the tetanus poison.

W. A. BRENNAN.

**Robertson, H. E.: The Present Status of Magnesium Sulphate in the Treatment of Tetanus.** *Arch. Int. Med.*, 1916, xvii, 677.

Robertson gives a comprehensive review of the clinical reports of the use of magnesium sulphate in the treatment of tetanus. From a careful study of the individual reports it is readily apparent that antitetanic serum not only holds a valuable place in the treatment of all cases of tetanus, but also that the administration of magnesium sulphate by intralumbar injection has brought about a definite decrease in the percentage of deaths from tetanus. The same may be said of the subcutaneous method, but the intravenous method has been disappointing.

The deleterious effects of magnesium sulphate is an important factor in its administration. An overdose may result in sudden death from its effect on the heart or its centers in the spinal cord. This accident has not followed the subcutaneous method, and as death takes place instantly there is no treatment. The most frequent bad effect is from depression of the respiratory center; this can be combated by the administration of calcium chloride, 50 ccm. of a 2 per cent solution into the muscles. Physiological salt solution would rapidly give relief or the administration of 1 mg. of physostigmin or eserine. The good effects of these drugs are not so apparent when the magnesium sulphate has been given by an intralumbar injection, and it was suggested to wash out the subarachnoid space with normal salt solution.

He quoted Meltzer as suggesting the following dosage: Intraspinal, 1 ccm. of a 25 per cent solution for every 22 pounds of body weight. Subcutaneous, 1.2 ccm. of 25 per cent solution per kilo. As the subcutaneous injection is painful, it may be necessary to precede the injection by same local anæsthetic, as novocaine.

D. L. DESPARD.

**Emery, W. D.: Some Factors in the Pathology of Gas Gangrene.** *Lancet*, Lond., 1916, cxc, 948.

Gas gangrene is described as the most interesting disease of the present time. It is of equal interest to the surgeon and pathologist. To the latter it is of special interest because it is a disease caused by an organism most virulent under certain conditions, and absolutely non-pathogenic under others.

The disease may appear in a slight wound and the part may become gangrenous in as short a space

of time as two hours, when it emits a peculiar disgusting odor. This odor may be thrown out by the body of the wounded, and the nurses have become so sensitive to its presence that they recognize it as the "death smell." Death may take place with profound toxæmic symptoms in thirty hours. It is apt to develop much later, at the base or after arrival in the home hospital. The amount of gas varies. The worst cases show but little or no gas in the tissues. In others there is much gas, under tension, so that the tissues crackle on palpation. The lesion may be local with sloughing when there is no toxæmia present.

The symptoms of gas gangrene are induced by a bacillus which is almost devoid of pathogenic powers, first described by Welch as the bacillus aerogenes capsulatus; it is more commonly called in England the bacillus perfringens. Though an anaerobe it is not strictly so. It grows in milk, the cream at the top acting as a seal to prevent access of oxygen. It forms spores on media which contain proteids by preference. When grown on media containing glucose it forms enormous quantities of gas without depositing spores. The bacillus is but slightly pathogenic for rabbits, a trifle more so for guinea pigs, and is equally non-pathogenic for man in whom it is a normal inhabitant of the alimentary canal causing no harm. Furthermore, it is present at a certain stage in almost all wounds giving rise to no special pathogenic effects, and this is especially true when the organism is present alone and unmixed with streptococcus or staphylococcus infections. Cases of hæmorrhax and wounds of the knee have been known to recover where the organisms were found in vast numbers and where there was no rise in temperature. Such contradictions have caused observers to wonder if the welch bacillus is actually the cause of gas gangrene. All evidence points to the origin of gas gangrene from this bacillus, however. The bacillus of malignant œdema is at times associated with it, but its presence is difficult to detect. The mixed infections studied are not specially concerned in the development of gas gangrene.

Why is it that gas gangrene fails to develop in all the wounds in which its presence has been demonstrated? (1) We know that the bacillus is killed by the blood serum and plasma. (2) The toxin of the bacillus will inhibit emigration and kill leucocytes when present in large amount. (3) In cases of gangrene millions and millions of bacilli are found, but very few leucocytes. (4) Dead and lacerated tissues, thoroughly inoculated with dirt and a large blood-clot, are usually found in the worst of the war wounds, such as shell wounds. In such wounds bacterial growth will take place unrestrained, and if there is no free escape of the toxin it will accumulate to such an extent that when it soaks through into the healthy tissues, the leucocytes are killed on the spot, growth continues and spreading gangrene is set up. This condition is facilitated by interference with the blood supply. This may



explain the reason for the frequent appearance of gas gangrene in the forearm and leg in which the muscles are enclosed in fibrous aponeuroses in which they are rapidly strangled if swelling takes place therein. (5) Another point to be mentioned is the fact that the toxin, when it reaches a vein, causes thrombosis, and the vascular supply is still further interfered with. (6) The mere presence of devitalized tissue is not sufficient to give rise to the alarming symptoms of gas gangrene, but its presence in the absence of drainage offers a bad prognosis.

As to treatment, early drainage, removal of clot and dead tissue, encouragement of the circulation, re-establishment of tissue surfaces to health by the use of hypochlorous solution, and promotion of lymph lavage by hypertonic solutions, are the best methods of treating wounds with gas gangrene or those that are threatened with this virulent infection.

LOUIS A. LAGARDE.

**Ritter: Gas Burns** (Ueber Gasbrand). *Beitr. z. klin. Chir.*, 1915, xcvi, 47.

Ritter gives his experiences regarding the frequent wound infections due to the gas bacillus and which he terms gas burns. The disease is characterized by the formation of gas and by the burning up of the tissues. It should not be termed gas phlegmon (connective-tissue inflammation). Inflammation and suppuration usually accompany the injury but are not a necessary part of the clinical picture. The disease is caused by an anaerobic gas-forming bacillus. Ritter thinks it necessary to emphasize the liability to direct infection from the disintegrated matter of dead bodies lying near the trenches.

Gas burns may be noticed very soon after the onset of an injury. The author has found it twelve hours afterward. There are two forms: the epifascial type which develops usually without danger and the subfascial which is always serious. Death may result but this is due not to sepsis, but to blood infection caused by invasion of the bacillus.

The infection may be strictly local and many of the worst cases are of this type. Such local infections are characterized by an abnormally high number of thromboses in the beginning of the process. Although such local infections are most frequently situated in the extremities, Ritter has found them in the brain, lungs, etc.

In 1,200 injuries he observed 42 cases of gas burn: 21 were in the lower extremities; 6 in the upper; 7 in the breast, neck, and abdomen; 4 in the brain; 4 in the lung.

Ritter figures his mortality in these cases as 42.9 per cent. According to Kuemmell about one-third of gas burn cases are fatal. Ludeck had a mortality of 85 per cent and Franz 53.4 per cent. When death occurs it is usually on the second or third day after the first symptoms are noted.

The treatment varies. In light external cases broad incisions usually give good results. Even in cases of deep-seated injuries repeated incisions with

chemical agents will mostly effect a cure, but the incisions, etc., must be thorough, and all pockets, necrotic areas, etc., must be thoroughly opened up and excised.

Of 25 cases thus treated by Ritter, he lost only one.

As a prophylactic the author recommends Bier's passive treatment.

He thinks the best results are obtainable from combining free incisions with the Aetz method. His procedure is to widely open up the orifice of the wound and clean away all debris so that nothing but fresh tissue is left. The trajectory of the bullets, etc., are also opened up as far as possible. All openings are thoroughly washed with soap and hot water.

The soap is rubbed into the tissues and rinsed away with water. By this treatment the author had success in some advanced cases which did not present themselves for twenty-four to thirty hours after injury. He emphasizes the necessity for radical excisions in such cases.

W. A. BRENNAN.

#### SURGICAL ANATOMY

**Rous, P., and Jones, F. S.: The Protection of Pathogenic Micro-Organisms by Living Tissue-Cells.** *J. Exp. Med.*, 1916, xxiii, 601.

The authors point out that there are a number of important diseases, among them leprosy, tuberculosis, gonorrhœa, Leishmania, caused by microbic parasites which live more or less habitually within tissue-cells. The part played by the host cells in the life of such micro-organisms and also in the distribution within the body of the diseases they induce has obvious importance. They found that it was impossible to make direct *in vitro* tests with the micro-organisms mentioned and the cells in which they live, for the reason that they fail to give rise to circulating antibodies active enough to be suitable for the tests. But the problem can be approached, they found, by means of artificial systems, for example, by submitting leucocytes that have ingested bacteria to a bactericidal serum and observing its effect on the intracellular organisms.

Their experiments included that of a protection against a foreign antiserum, protection against an inorganic disinfectant and homologous antiserum, and from their work a number of facts seems proven.

1. Living phagocytes are able to protect ingested organisms from the action of destructive substances in the surrounding fluid, and even from a strong homologous antiserum.

2. There is evidence that the protection by phagocytes is largely if not entirely conditioned on their being alive.

3. These facts should be taken into consideration in the study of diseases caused by infectious agents capable of living within tissue-cells.

But they finally point out that it remains to be determined how far the protection of micro-organisms by living tissue-cells, especially cells incapable



of killing the micro-organisms, is important in disease processes. The phenomenon may have much to do with the survival in the animal body of organisms such as the leprosy bacillus which is so often found living within cells of the fixed tissues; and it may serve to explain in part the therapeutic difficulties in such instances. It may throw light, furthermore, on the formation of new disease foci at points of injury in individuals of high general resistance. For if an infective agent can be "walled" off from the action of the body fluids by the protoplasts of a single cell containing it, there is no reason why it should not be carried unharmed wherever this cell goes.

GEORGE E. BEILBY.

**Robertson, T. B., and Burnett, T. C.:** The Influence of Tethelin, and of Other Alcohol-Soluble Extractives from the Anterior Lobe of the Pituitary Body, upon the Growth of Carcinomata in Rats. *J. Exp. Med.*, 1916, xxiii, 631.

One of the authors recently succeeded in isolating the growth-controlling principle, tethelin, from the anterior lobe of the pituitary body. The methods of isolating the substance, its chemical properties and physiological actions, and the evidences of its identity with the growth-controlling principle have already been published. It has also been already pointed out that the hypodermic administration of emulsified tissue of the anterior lobe of the pituitary body to rats, either directly into or in localities remote from the tumors, leads to a remarkable acceleration of the growth of the Flexner-Jobling carcinoma, especially during the period of growth between the twentieth and thirty-seventh days succeeding inoculation. This effect is specific since similar administrations of liver tissue, during the same period, far from causing any acceleration of the growth of the tumors, actually resulted in a slight but definite retardation of their growth.

In view of these results it appeared of importance to ascertain whether tethelin also reproduces the effect of the whole anterior lobe upon the growth of carcinomata, and to that end the investigations which are about to be described were undertaken. At the same time it seemed advisable to the authors to ascertain whether any other alcohol-soluble extractive of the anterior lobe of the pituitary body exerts any action upon the growth of carcinomata. Three such fractions were prepared and their action upon the growth of carcinomata was investigated, with the following results:

1. The hypodermic administration of tethelin increases markedly the rate of growth of the primary tumor and the tendency to form metastases in rats inoculated with carcinoma, in this, as in other respects, reproducing the action of the whole anterior lobe of the pituitary body.

2. Other alcohol-soluble extractives of the anterior lobe of the pituitary body, with the exception of the lecithin fraction, exert no appreciable effect upon the growth of carcinomata in rats.

3. The lecithin fraction, as in previously reported

experiments in which the authors employed lecithin obtained from eggs, causes evident retardation of the growth of carcinomata in rats.

GEORGE E. BEILBY.

**Higgins, H. L., Peabody, F. W., and Fitz, R.:** A Study of Acidosis in Three Normal Subjects with Incidental Observations on the Action of Alcohol as an Antiketogenic Agent. *J. Med. Research*, 1916, xxxiv, 263.

The authors call attention to the fact that it has long been known that the administration of a carbohydrate-free diet causes the development of a moderate acidosis in normal persons. The experiments in this paper were designed to obtain further data, primarily on the production of acidosis induced by a carbohydrate-free diet, and its effect on the metabolism of normal individuals, and, incidentally, on the action of alcohol on such an acidosis. The subjects made use of were three healthy men between the ages of 28 and 33 years. The diet, which consisted chiefly of eggs, butter, meat, fish, and sugar-free cream, was practically carbohydrate-free. It was prepared with great care in the diet kitchen of the Peter Bent Brigham Hospital, under careful supervision, and was served in an appetizing manner. The subjects endeavored to eat about 3,500 calories per day, largely of fats, with the idea of getting a high degree of acidosis, but they did not relish so much food and on some days could not take it all. The general plan was to make observations on the gaseous metabolism and urine on one day when the men took an ordinary mixed diet, then on three days with carbohydrate-free diet, then on one day with carbohydrate free diet plus whiskey, and finally on a sixth day a diet with the same protein and caloric content, but with much of the fat replaced by carbohydrate.

Total nitrogen in the urine was determined by the Kjeldahl method. Urinary acidity and ammonia were tested by Folin's methods. The hydrogen-ion concentration of the urine was determined by the method of Henderson and Palmer. Acetone was distilled by a method suggested by Scott-Wilson and titrated by the Messinger method.  $\beta$ -oxybutyric acid was estimated by the Shaffer and Marriott method. Bang's micromethod for blood sugar was used, and Marshall's urease method for blood urea. The alveolar air was taken by the method of Haldane and Priestley with a Siebeck valve. Four samples, two at the end of expiration, and two at the end of inspiration, were taken before and after the morning and afternoon metabolism experiments and just before the subjects went to bed at night. The gaseous metabolism was determined by means of the Tissot spirometer and the Haldane gas-analysis apparatus.

In three healthy subjects a carbohydrate-free diet caused the development of varying degrees of acidosis. The acidosis was shown by a lowered  $\text{CO}_2$ -tension of the alveolar air, by an increased urinary excretion of ammonia nitrogen and of



acetone bodies, and by the increased titrable acidity of the urine. The acidosis was accompanied by subjective sensations of malaise, an increased oxygen consumption, a negative nitrogen balance, increased pulse-rate, and increased ventilation. Alcohol given to the subjects on this diet in dosage comparable to that used for clinical purposes did not stop the progress of the acidosis or show any antiketogenic action. Coincidental with its administration there was further increase in the oxygen consumption and in the disagreeable subjective symptoms.

GEORGE E. BEILBY.

**Pellegrini, E.: Intestinal Function in Pancreopathic Conditions** (Funzionalità intestinale in pancreopatici). *Clin. med. ital.*, Milano, 1915, liv, 625.

The pancreatic function must be studied in two ways: according to the fluids which pass from the gland into the intestine; and according to the wider and more general action which the products of internal secretion exercise on the organism.

The author states that a thorough investigation of pancreas functioning has been carried out in Maragliano's clinic in the University of Genoa. The results from various standpoints will be published from time to time. The methods of research are described in great detail as well as the clinical histories of ten patients and some controls, the results being elaborately tabulated.

From the results the author draws these conclusions:

1. In determinate pancreatic lesions the coprologic tableau is constituted as follows: (a) stools rich in water, with abundant alimentary residue, excessively steatorrheic with desquamatory elements; (b) stools deprived almost wholly of sterobilin with a reaction principally alkaline; (c) stools rich in unmodified albuminoid residues; (d) stools with augmentation of undigested carbohydrates; (e) the formula of fatty matters almost universally inverted, the quantity of neutral fatty matters prevail considerably; (f) digestion of the nucleus of ingested meat completely suppressed.

2. The coprologic picture shows that in pancreatic disease elimination of water is profoundly modified; proteolytic, amylolytic, and especially steatorrheic powers are greatly diminished; the nucleolytic power is lowered; the external functions of the pancreas are totally compromised.

3. Reciprocally, it is certain that the index of the lesions or the insufficiency of the pancreas must be sought in the diminution of the digestive power, especially for fats, and in the diminution of the nucleolysis of ingested meats.

W. A. BRENNAN.

**Auer, J., and Meltzer, S. J.: The Intravenous Injection of Magnesium Sulphate for Anæsthesia in Animals.** *J. Exp. Med.*, 1916, xxiii, 641.

The effect on animals of intravenous injections of magnesium sulphate was investigated by the authors about ten years ago and its use in this way in

general was discouraged. However a series of experiments made by the authors with intravenous injection of magnesium sulphate in cases of experimental tetanus, and the meager but satisfactory experience which Kohn and Straub had with the employment of this method in cases of tetanus in human beings, induced the authors to take up the experimental study in animals of the employment of magnesium sulphate by intravenous injection for the purpose of producing anæsthesia. This was done as a preliminary test for the admissibility of studying the exclusive use of intravenous injections of magnesium sulphate as a means of producing, or at least inducing, anæsthesia in human beings. Their experiments seem to justify the following general conclusions:

1. By the intravenous injection of 4:1,000 magnesium sulphate into dogs at a certain rate, a stage can be reached where the abdominal walls are completely relaxed and when section of the abdomen and stimulation of sensitive parts of the parietal peritoneum do not produce pain or elicit any reaction of the animal. At the same time spontaneous respiration may still be maintained within normal limits and the lid reflex be fair or even normal. In this state intratracheal intubation for artificial respiration can be easily accomplished. This stage may be attained in twelve to fourteen minutes when the rate of injection is about 3 ccm. per minute. When this stage is attained the rate of injection should gradually be reduced, otherwise, sooner or later, spontaneous respiration will be abolished, and by a further maintenance of the rate of injection all the skeletal muscles may become paralyzed.

2. When the injection of magnesium is continued for a longer period, the paralytic effects of the magnesium injection will set in, even when administered at a slow rate.

3. The paralysis of the respiratory function is readily met by intrapharyngeal insufflation, which is easily executed even without training in this procedure, or by the method of intratracheal insufflation, if executed by one trained in its management.

4. When the respiration of the animal is accomplished by insufflation, the paralytic effect of the magnesium may be abolished fairly rapidly by an intravenous injection of about 10 ccm. of an 8:1,000 calcium chloride solution; or it may disappear slowly after the infusion of the magnesium solution is discontinued for some time. The latter mode of disappearance may be favorably accelerated by an intravenous infusion of 60 to 100 ccm. of a 4:1,000 solution of sodium sulphate.

5. The production of anæsthesia by intravenous injection of magnesium sulphate should not be undertaken unless an apparatus for intrapharyngeal insufflation is at hand, because in exceptional cases the disappearance of spontaneous respiration may be one of the earliest consequences of the magnesium injection.



6. The injection of calcium chloride should not be employed in cases in which the subject shows cardiac insufficiency. In such instances, moreover, injections of magnesium should not be used for the purpose of anæsthesia, at least not until greater experience has been acquired in the employment of this method.

GEORGE E. BEILBY.

**Pellegrini, E.: Stercobilin** (Sulla stercobilina). *Clin. med. ital.*, Milano, 1916, liv, 791.

Pellegrini presents some of the results obtained in experimental researches on intestinal function carried out at Maragliano's clinic in the University of Genoa.

The results were obtained from observation of patients in whom there were more or less notable gastro-enteric disturbances. The methods followed for the estimation of urobilin in the urine were those of Mareschal, Huppert, and Hammarsten, and for biliary pigments those of Gmelin and Nencki. Gmelin's method of blood examination was followed.

The results show that there is an agreement in the conditions of elimination between stercobilin and urobilin in conditions in which these pigments are eliminated normally. This normal urofecal elimination exists in spite of disturbances of the digestive apparatus caused by gastric, enteric, cardiac, and other lesions. In hepatic lesions, stercobilin diminishes rapidly until only minute traces are left and icterus may or may not be present. In such patients the elimination of urobilin takes the form of pathologic urobilinuria, and this is particularly noted in the case of pancreatic subjects.

The facts appear to show that hepatic conditions notably influence the elimination of urobilin and that in cases where stercobilin is absent the elimination of urobilin is pathologic. W. A. BRENNAN.

**Gates, F. L., and Meltzer, S. J.: An Experimental Study of the Additive and Antagonistic Actions of Sodium Oxalate, and Salts of Magnesium and Calcium in the Rabbit.** *J. Exp. Med.*, 1916, xxiii, 655.

On the basis of the hypothesis that magnesium favors inhibition of the various functions of the nervous system, Meltzer and Auer studied extensively the action of magnesium salts upon various animals. In injecting magnesium sulphate subcutaneously, they found that a certain dose, which varies with the species of animals, is capable of producing profound anæsthesia and paralysis from which the animal recovers. For rabbits this dose amounts to about 1.5 gm. of magnesium sulphate ( $\text{MgSO}_4$  and 7  $\text{H}_2\text{O}$ ) administered in a molecular solution. Larger doses cause the death of the animal, as a rule, by respiratory paralysis. With an effective but non-fatal dose in subcutaneous injections the development of the depressing, inhibitory effect is gradual and fairly slow.

In the course of their studies, Meltzer and Auer found that calcium, which is chemically closely

related to magnesium, is biologically apparently the antagonist of the latter. When calcium is injected intravenously, shortly before or immediately after the respiration stops, into an animal which has received a fatal dose of magnesium, the animal will recover in less than a minute, provided, of course, that the circulation is still effective during the calcium injection.

The problem which the authors have endeavored to solve experimentally in this study is: "Can the depressing component of the calcium-precipitating oxalate be brought out by a simultaneous administration of a subminimal dose of a magnesium salt?" Their experimental study seems to have firmly established the following facts:

1. Subcutaneous or intramuscular injections of sodium oxalate in subtoxic doses, when administered to an animal which has received a subminimal dose of magnesium sulphate, produce profound anæsthesia and paralysis of long duration, although the usual effects of sodium oxalate alone are of a stimulating character. This fact is, in general, in harmony with the results reported by Starkenstein who, however, seems to have used the combination of the two salts in one solution; namely, that of magnesium oxalate.

2. The combined injections of subminimal doses of sodium oxalate and magnesium sulphate produce a strong reduction, or even, at times, a complete abolition of the conductivity of the motor nerve-endings.

3. An intravenous injection of calcium salts brings on a recovery from the profound and prolonged effects of the combined action of sodium oxalate and magnesium sulphate, which is as prompt action as is observed in experiments in which effective doses of magnesium alone are given. This fact is the more noteworthy, since depressions of long duration produced by prolonged continuous injections of magnesium solutions alone do not respond very promptly and effectively to calcium injections.

As will be recalled, the starting point for this investigation was the hypothesis that substances which are capable of precipitating calcium — a biological antagonist of magnesium — ought to be capable of increasing the depressive effect of magnesium. The authors' experiments proved that this assumption was correct. This would seem, therefore, to justify the interpretation that the augmenting action of sodium oxalate has its cause in the ability of the latter to precipitate calcium and thus increase within the body the amount of unantagonized magnesium. However, they state expressly that this view is, for the present, still no more than a hypothesis and does not exclude other possible interpretations of the facts. As they pointed out it speaks against this hypothesis that oxalates do not produce phenomena of depression; the toxic symptoms produced by oxalates exhibit distinct signs of increased and not of decreased irritability.

GEORGE E. BEILBY.



**Lewis, D.: The Appearance of the Pressor Substance in the Foetal Hypophysis.** *J. Exp. Med.*, 1916, xxiii, 677.

It has been demonstrated that the pressor substance of the posterior lobe of the hypophysis is secreted by the pars intermedia, a derivative of the pharyngeal pouch. The present study was undertaken by Lewis with the hope of determining at what period in foetal life the pressor substance appears and of correlating the cytological changes in the pars intermedia with the establishment of secretory function, using the appearance of the pressor substance as an index. He found that the hypophyses of pigs just before birth were large enough to permit of separation of the two lobes, but in the earlier states this was impossible. In order to secure uniform material for injection the extracts were made from the entire gland in all instances. The glands were obtained fresh and extracted in absolute alcohol to remove the depressor substances. After extraction was completed, the alcohol was filtered off and the residue dried in a desiccator. The dried residue was kept in small bottles until desired for use, when a salt solution extract was made for intravenous injection.

As a result of his experiments Lewis concludes that the pressor substance of the hypophysis is so marked in the pig foetus measuring 175 mm. that it seems probable that a foetus of this length is independent of the secretion of the mother's hypophysis.

GEORGE E. BEILBY.

**Alberti, O.: Tubercular Bacillæmia—a Clinico-Experimental Study** (*Sulla bacillemia tuberculare*). *Clin. med. ital.*, Milano, 1916, liv, 731.

A question which has occasioned a great deal of discussion in recent years is that which refers to the presence of the Koch bacillus in the circulating blood of individuals attacked by tuberculosis. The author reviews the voluminous literature commencing with Willemin's animal experiments in 1868 down to the present time. In his opinion the discord which exists in the findings of the different authors is to be explained by faulty methods in the technique employed.

He, therefore, undertook to carry out a series of experiments, following a rigorous technique designed to exclude possible sources of error. He examined the blood of 50 individuals, of which 30 were unquestionably tuberculous, 10 were suspected and 10 were clinically healthy. In 35 cases the complete research was made: double microscopic examination by the methods of Staubli-Schnitter and Rosenberger; and parallel with this a biologic test comprising inoculation of the blood in the peritoneum of guinea pigs.

In the other 15 cases the research was limited to the biologic test alone. Bacterioscopic examination in the 35 cases gave 5 positive results with the Staubli-Schnitter method and 3 with the Rosenberger method.

Biologic tests in the 50 cases and with 78 guinea pigs have given no manifestly positive results. Commenting on these results the author thinks that tuberculous bacillæmia is met with very infrequently and is only manifested in tuberculous individuals; it is an inconstant and transitory phenomenon which ought not be considered—at least as far as chronic tuberculosis is concerned as a true septicæmia, but simply as a bacteræmia of little clinical importance. Tuberculous bacillæmia has no relation to the degree of gravity of tuberculous lesions and has no practical value from either the point of view of diagnosis or prognosis.

W. A. BRENNAN.

**Descomps, P.: Epiploon and Pericolitis** (Epiploon et pericolite). *Rev. de chir.*, 1916, xxxv, 109.

For some years past many articles have been written on the rôle of pericolitis in the pathogenesis of chronic colitis and stasis. Inflammations and stasis in the colon usually localize in certain zones which favor them, the terminal ileum and initial segment of colon, the transverse colon, and colonic angles.

In this large territory there is a special segment in which inflammation and stasis occur in the majority of cases. This is the right colonic segment. The anatomico-physiological conditions found there are of capital importance and show the part played by the epiploon and therefore by epiploitis in the production of pericolitis and consequently of colitis and stasis in this segment.

The author therefore devotes the greater part of his article to a study of the anatomy of the epiploon including the arteries, veins, and lymphatics.

Walther and his pupils have at various times from 1898 to the present shown the connection of epiploitis and chronic colitis, and Descomps himself, basing his remarks on 36 observations of Walther, has shown the preponderant part played by the epiploon in the pathogenesis of pericolitic phenomena and the favorable effects produced by epiploic resection and liberation of pericolonic adhesions as a complement to appendectomy.

There are two ways in which the epiploon may be involved. First, by the formation of adhesions with the neighboring organs and especially with the right colon. Such adhesions may be primitive, i.e., anatomic in type, or they may be pathologic, inflammatory adhesions. Of this latter type are the restricting bands, derived from the epiploon, which give rise to the so-called membranous pericolitis. The second way in which the epiploon may be involved is less known but not less important. It may become inflamed and sclerotic without forming pericolonic adhesions. The loss of suppleness and mobility of the epiploon gives rise to pericolitis and stasis. This type is frequent and in the most recent statistics of Walther this non-adherent type was found 191 times as against 181 of the adherent type.

W. A. BRENNAN.



## RADIOLOGY

**Boggs, R. H.: The Treatment of Epithelioma of the Lower Lip.** *Interst. M. J.*, 1916, xxiii, 114.

Epithelioma of the lower lip, however innocent in appearance, is nevertheless cancer, and often shows a degree of malignancy that is not usual in epithelioma in other situations. It seems to be rather a regional than a local lesion. The lymphatics which drain it should in every case receive the same attention as the visible lesion. Until recently the best routine treatment has been early surgical removal of the ulcer and lymphatics. Today the general practitioners commonly refer lower lip epitheliomata for radium therapy, because they can be successfully treated by this method.

At first pioneer work had to be done and the disappointments were many. Radium was scarce, the apparatus elementary, and the limitations many and serious. Only cases of which surgery despaired built their last hope on radiotherapy. The results were necessarily uncertain and a severe test of the new medical faith and hope. Yet there were excellent results that justified the hope of the physician and the confidence of the patients. In consequence, with our present supply of radium, the powerful transformer, and the Coolidge tube, we now stand on firm scientific ground and radiotherapy has a definite place in the treatment of malignancy. To-day the radiotherapist has a broad and convincing clinical knowledge of his subject. The author is convinced that at present radiotherapy is the best routine treatment for epithelioma at any stage, and he also believes that this will be the ultimate decision of every modern physician. He wishes, however, to caution against haggling radiotherapy of lip cancers as much as against haggling surgery of them. Radiotherapy, to be reasonably successful, demands competent application. Radiotherapeutic treatment of lower lip epithelioma, was discussed at a recent meeting of the American Dermatological Society, and it was agreed that it is a legitimate and successful treatment in properly qualified hands. That epithelioma can be eradicated by radiotherapy has been definitely proved and in advanced cases it offers more hope than any other method. Cures have been effected in far advanced cases, but the sooner a precancerous change is treated the better, prophylaxis always being the safest and the surest. It is only fair and just, however, that at present no one should attempt this treatment without adequate previous training and experience under proper direction.

The technique must, in every case, be adapted to the individual patient and his needs. Scientific dosage is a matter of physics and of therapeutics. Physical dosage can be measured exactly, but therapeutic dosage depends on the technical and practical judgment of the physician. As an instance in point, the author prefers radium used locally for epithelioma of the lower lip, and for the adjacent glands radiation with the Coolidge tube. One

capsule is placed inside, another on top, and another on the outside of the lip to secure complete irradiation. Usually the first reaction suffices for healing a moderate lesion, but the scar must be healthy, pliable, without retraction, and without scaliness before a case can be considered clinically cured. The treatment of the adjacent glands must never be neglected even for the smallest lesion. Any partial removal of an epithelioma must be condemned.

The author's conclusions are as follows:

1. Every cancerous cell must be eradicated if the treatment of epithelioma of the lower lip is to be successful, because experience has shown that this epithelioma is a regional rather than a local lesion.

2. All precancerous lesions should be treated by a method that leaves no scar whatever.

3. Many hold the results of radiotherapy to be as good and even better than those obtained by surgery, and that surgery should be resorted to only in selected cases.

4. There are a number of radiotherapists who have had sufficient experience with epithelioma of the lower lip and who have obtained results that justify them in considering radiotherapy a perfectly legitimate method of treatment.

5. Inefficient work, as it is being done by those who have simply bought the usual apparatus and received some instructions in its use from the manufacturers, cannot be too emphatically condemned nor too strongly deprecated.

**Boggs, R. H.: The Treatment of Tuberculous Adenitis by Roentgen Rays.** *N. Y. M. J.*, 1916, ciii, 1016.

As the end-results in cases of tuberculous adenitis treated by the roentgen rays are generally satisfactory, Boggs believes many cases that are subjected to surgical procedure could be better treated by radiation, thus sparing the unsightly scarring with the not infrequent sinuses which when long delayed in healing are often finally referred to the radiologist. As is well known operation is often followed by local recurrence and at times gives rise to a general tuberculosis, the diseased glands often being of wider distribution than the clinical signs indicate, making it difficult and at times impossible to remove them. The contrast is marked and if, as is alleged, 90 per cent of these cases are permanently cured by radiation, it would seem that this method should be adopted as a routine. Radiation in these cases should not be confused with that employed in the treatment of malignancy, and while hard rays are to be used they should not be given in massive doses, as the general system must dispose of the products of degeneration, and it is better not to overload it, especially when as a rule it is greatly impaired.

Since the rays are not bactericidal, the beneficial effect must be produced by destroying tissue of low resistance, thus rendering the soil barren; but attention is called to the fact that Crane has advanced the theory that by this process an autogenous



vaccine is set free, and this is given in explanation of those instances where a tuberculous process at some distant point from that treated will likewise disappear. The observation has also been made in cases where tubercle bacilli have been found in the sputum, subsequent examinations failed to show their presence. While treating these cases, especially those about the neck, careful inspection must be made for local sources of infection in the mouth and throat, bad teeth, and swollen tonsils; but it is by no means necessary to remove every swollen tonsil, for many will improve after the glands subside. When a chain of lymphatic glands has been properly rayed the glands and vessels undergo a fibrous degeneration with almost entire obliteration, with no marked influence upon the surrounding tissues. Attention is called to a series of 1,344 cases collected by von Mutschenvacker where operation was found necessary in only 9 per cent. Mathews is also quoted and his five reasons against operation are given. Boggs has also considered the possibility of mistake in diagnosis but calls attention to the fact that such conditions as Hodgkins' disease and sarcoma also call for radiation.

W. S. NEWCOMET.

**Gerber, I.: The Use of the Polygram in Gastro-duodenal Diagnosis.** *Am. J. Roentgenol.*, 1916, iii, 220.

Gerber, for the past several months, has been using the polygram method of Levy-Dorn, modified somewhat by the use of modern instrumentaria and technique, and has found it almost indispensable in gastroduodenal examinations. He makes only two exposures on a single plate, with an interval between exposures of about eight seconds. This may be lengthened somewhat in cases with very sluggish peristalsis or shortened a bit when the peristalsis is extremely lively. The polygrams are made in both the erect and the prone positions.

In the normal stomach, the passage of the peristaltic waves can be seen in a most graphic manner. The two outlines cross and recross each other in such a way as to show clearly that every portion of the muscular wall is taking part in the peristaltic conduction. Thus it can be seen whether or not there is any *Bewegungsdefekt* or regional lack of motility. In chronic gastric ulcer, the area of induration will show definitely as a portion of the gastric wall that does not take part in the peristaltic conductivity. Craters or niches stand out prominently. Incisuræ will show as a permanent incutting, easily distinguished from the criss-crossing peristaltic waves. In duodenal ulcer, the characteristic deformity is sharply shown. In gastric carcinoma, both filling defects and defects of motility can be observed by this method. In noting pressure from extragastric tumors, distended gall-bladder, etc., the polygram may be of considerable assistance.

It might be objected that all the above information can be noted on the fluorescent screen. This

is certainly true in some cases, but in many others, such as early carcinoma, small antral ulcers, and some types of duodenal ulcers, the information is either very difficult or absolutely impossible to obtain from a fluoroscopic study only. Besides, the polygram affords a permanent record. In other words, it offers the advantages of serial plates without the great inconvenience and expense of obtaining a large and complete series.

The author does not by any means offer the polygram as a substitute for a thorough serial study, but he does believe that it will, in many cases, save considerable time, trouble, and expense for those who confine themselves chiefly to the roentgenographic method in the study of gastroduodenal disease.

W. A. EVANS.

**Newcomet, W. S.: The Comparative Value of Roentgen and Radium Radiation in Therapeutics.** *Am. J. Roentgenol.*, 1916, iii, 208.

Aside from the fact that roentgentherapy has been brought to a high degree of refinement in comparison with radiumtherapy, there are cases which appear to fall within the distinct province of each. In superficial epithelioma, the method which gives the best results is merely a matter of technique, but in cases of carcinoma in the cavities of the body, radium is without a peer.

Upon purely clinical grounds, all things being equal, the treatment of all cases may be divided into two classes:

1. Those in which a localized radiation is desired and in which these radio-active elements are to be preferred.

2. Those calling for diffused radiation over a more or less extended area, in which roentgen radiation is to be preferred.

Modification must be made in both, depending upon the depth of radiation desired.

It has been previously stated that the difficulty of comparing these two forms of radiation is due to the wide variation in technique; but, generally speaking, the results are obtained from radium with less damage to surrounding tissues than similar conditions treated with roentgen radiation.

The idea seems prevalent that enormous quantities of radio-active element are necessary to produce results. While large quantities are desirable, the fact remains that a small quantity judiciously applied will often prove of greater benefit.

In conclusion it might be fairly stated that an exact comparison of the two forms of radiation is extremely difficult, due to the wide difference in technique and the wide variation of results reported by various writers in both fields; this is further confused by the fact that many individuals employing these radio-active elements have had very little experience in general radiology. From the author's personal experience and observation, however, it still appears that there is and will be a field for both forms of radiation as well as a very broad common ground where both will yield results equally, de-



pending entirely upon the individual technique employed.

W. A. EVANS.

**Stewart, W. H.: Roentgen Diagnosis of Obscure Lesions of the Gastro-Intestinal Tract.** *Am. J. Roentgenol.*, 1916, iii, 202.

The tendency of roentgenologists of today to ignore the clinical picture and depend almost entirely on the fluoroscopic and roentgenographic findings in arriving at a diagnosis has prompted the author to make a plea for the more general use of every means available in every case, combining the roentgen interpretations with the symptoms and laboratory reports before an attempt at diagnosis is made. Too often what apparently was a clear case roentgenologically has been proved to be otherwise when compared with surgical or post-mortem findings.

In order that it may be possible to render valuable aid in the diagnosis of gastro-intestinal lesions, especially the large number of borderline cases in which the patients suffer from pain and distress in the right upper quadrant and which may be caused by kidney, gall-bladder, duodenal, or appendicular disease, it is necessary that every effort should be made to educate the medical profession to refer their cases to the roentgenologist for diagnosis and not to restrict his investigations to any one part of the gastro-intestinal tract. Just as a stone in the left kidney may give rise to symptoms on the right side, so may the cause of symptoms in the stomach be found in the appendix or in the lower colon; therefore a negative diagnosis cannot be accepted as final until the entire gastro-intestinal tract has been examined.

Stewart presents a series of cases illustrating the cardinal points which he has attempted to bring out, namely, that a thorough physical examination and complete history, together with a record of the laboratory reports, be combined with the roentgen findings of a complete examination before arriving at final conclusions. This series consists of several interesting reports of cases, accompanied by illustrative roentgenograms, which show conclusively how the roentgenologist, had he not been in full possession of the clinical and laboratory findings in the case, would have gravely erred in his diagnosis.

W. A. EVANS.

**Holding, A. F.: Roentgen Deep Therapy in Malignant Tumors.** *Am. J. Roentgenol.*, 1916, iii, 191.

The author's report covers cases which have been observed during a period of three years, including not only malignant tumors, but also non-malignant diseases, such as lupus vulgaris, keloid, acne vulgaris, exophthalmic goiter, myoma, etc. In all cases of non-malignant disease, with the exception of myoma, exophthalmic goiter, and tuberculous adenitis, and in cases of superficial malignancy, the author urges the use of physical methods rather than surgical, for the reason that with physical methods, which include roentgenotherapy, coagula-

tion, and the ultraviolet light, a cure is obtained with the best cosmetic results, without hæmorrhage or opening up the lymphatic vessels, without pain or the need of an anæsthetic, and without loss of time from employment or hospital confinement. The results as shown in the tabulations are very convincing.

The author claims priority in the treatment with the roentgen ray of carcinoma testis of teratoid origin and carotid gland tumor, with very pronounced ameliorating effects.

Another group of cases in which improvements have been shown are those of intrathoracic sarcoma and carcinomata. Holding urges the employment of roentgentherapy in all of these cases, even the most hopeless, for in all a certain degree of relief can be obtained, and some may be even symptomatically cured.

In summing up this series of cases, the following conclusions are reached:

1. The most important point in connection with the use of physical methods for therapeutic purposes is that they aid nature to cure superficial malignant tumors much better than surgical methods.
2. Under roentgen deep therapy it is a common occurrence to have tumors undergo retrograde metamorphosis, or even to disappear.
3. In hopeless cases these physical methods enable nature to effect marked amelioration of the symptoms.
4. Occasionally this amelioration of symptoms amounts to a symptomatic cure.
5. The amelioration of symptoms is distinctly worth while.
6. If these physical methods ameliorate the symptoms in hopeless cases, patients having operable lesions should not be denied the benefits of these physical methods after operation.
7. Two forms of tumor not previously reported in medical literature are markedly ameliorated by roentgen deep therapy, namely, carcinoma testis of teratoid origin and carotid gland tumor.
8. Every effort should be made to perfect the technique and the use of adjuvants to increase the number of symptomatic cures and make permanent the ameliorations.

W. A. EVANS.

## MILITARY SURGERY

**Hagedorn, O.: Finding of Position of Retained Bullets** (Steckschuesse und ihre Lagebestimmung). *Beitr. z. klin. Chir.*, 1916, xcvi, 546.

Retained bullets are most frequently found to be shrapnel, and they are almost always found to be encysted, probably owing to the inflammation caused by the foreign body aided by the blood accumulated round it, giving rise to the formation of a cyst.

The first question arising is whether or not the bullet should be removed. The most important objective disturbances indicative of removal are disturbance of motor function, and the signs of



vascular or nerve pressure. In the presence of such dangerous symptoms and serious functional disturbances and when the bullet can be reached without further severe destruction of tissue it should be removed.

For localizing the position of the foreign body, two roentgen pictures in different projections are usually sufficient, the intersection of such projections giving the line in which the body lies; but when the bullet lies in the frontal part of the head, in the shoulder or other positions of very irregular contour this method is unsatisfactory and the apparatus devised by Weise has in such cases given good results in the author's practice. The method is simple and satisfactory in its results.

W. A. BRENNAN.

**Hull, A. J., Keogh, A. H., Pilcher, E. M.: Surgery In War.** *Royal Army Medical Corps, Blakiston, Son & Co., Philadelphia, 1916.*

This small octavo volume of 383 pages is a summary of the surgical experiences and conclusions of the present European War by Major Hull and a number of other well-known contributors.

The author states that on the bacteriological side, Sir A. E. Wright's work as shown by recent surgical developments has revolutionized the method of treating sepsis. The object of the work is to give members of the profession, unacquainted with war surgery, an insight into what is being done in military hospitals.

Col. E. M. Pilcher points to the definition of military surgery, which is after all but the surgery of gunshot wounds, with the broad interpretation understood in military parlance; viz., injuries from bombs, hand grenades, and everything set in motion by an explosive compound, as well as wounds from projectiles emanating from rifled arms, both great and small. The vast difference between civil and military surgery is due to the immense difference in the conditions under which the work is done. On the one hand there are conditions in which the environments dominate the surgeon, and on the other, conditions in which the surgeon dominates his surroundings. The civil surgeon operates under conditions approaching an aseptic ideal, whereas, the military surgeon's field is seldom aseptic but almost always precarious. The wounded man, though he may be fit physically, is often exhausted by the fatigue and privations of campaigning when he is stricken on an infected soil on which he is apt to lie for days before surgical aid can reach him. He is next subjected to the trying influences of long, and often improvised transport, during which proper food, good nursing, and favorable climatic conditions are frequently absent. The surgeon's difficulties are most trying. Hospitals have to be improvised in the beginning of the campaign. These are often overcrowded from the sudden accession of wounded, which arrive when least expected. The overcrowding often brings scarcity of food and surgical supplies. To add to the difficulties at hand, the wounds, which are all infected and in a class to

themselves, are of manifold varieties, occurring in all parts of the body and involving every tissue.

The foregoing facts justify the claim that military surgery is a special branch of surgery. Moreover, every campaign has conditions peculiar to itself. These are distinguished by the moral psychology of the combatants as related to the intensity of the fighting; the numbers engaged; climatic conditions; the character of the country, whether hilly or flat; and above all the character of the implements employed in inflicting wounds.

In the present conflict the magnitude of the campaign has brought the virile manhood of all the countries involved to the front, and with them the most capable surgeons in the world. In this little volume we find how valuable has been the assistance of the civilian members of the profession to the Director of the Medical Services of the British Army, and incidentally to the medical world.

A notable point in the present war is the way in which the bacteriologist has developed his indispensable services to the military surgeon. His value to the physician and the sanitarian in campaigns had been well established, but never before has the bond between the bacteriologist and military surgeon been observed. Infection and the wound have linked the two together, and to achieve success they must work hand in hand. It was through the rational and indispensable work of Sir Almroth Wright and his collaborators that an effective treatment of gunshot wounds has been worked out. Failure to properly arrest infection in war wounds at the beginning of the campaign demonstrated that our antiseptic methods were at fault, and it required the steady influence of the bacteriologists to direct surgical endeavor along proper lines.

Military surgeons in the United States who treated gunshot wounds in the region of the great plains, under cloudless skies, in pure air, on soil that had never seen a plow, were seldom troubled by the complications of varied infections. Likewise, the British surgeons who followed the armies in the Boer War gained experience in infection that served no purpose when compared with that obtained in a campaign fought with a great preponderance of wet days, upon a soil artificially sown with bacteria, largely of the fecal kind. This condition has made the labors of the bacteriologist indispensable to those of the surgeon.

The nature of the weapons has played a very interesting rôle also. To future generations the present conflict will be referred to as the Great War, but to the surgeon it will be known as the Pointed-Bullet War. Although pointed bullets were used in the Turko-Balkan War, and other minor conflicts, the present war is the first in which it has been universally and exclusively used in both machine-guns and the military rifle. There has been seen all the ugly wounding effects which were foretold as the result of experimental work. Compared to the effects of the ogival-jacketed bullet of the Krag-Jorgensen type, its shattering effects on bone is



better marked; its tendency to turn an impact makes it more destructive to soft parts in the chest and abdomen; its high velocity and flat trajectory cause explosive effects at longer ranges, and it is more apt to break up. When it disintegrates after striking side on it causes wounds not unlike those caused by dum-dum bullets, a fact which has brought about charges of inhumanity on all sides, such as those which have been heard at the beginning of all wars ever since the advent of the high-power military rifle. Accusations of inhumanity have been made more especially against the pointed bullet used by the British army, because disintegration of this projectile shows fragments from two separate nuclei—one of lead in the body of the envelope, and the other composed of aluminum occupying the point of the envelope. The British Government adopted this bullet some time ago, for the reason that being a trifle longer than the other pointed bullets, it offers more bearing surface against the rifle barrel, and thereby is steadied in flight. It is doubtful if the mere fact of a double nucleus adds to the tendency to disintegrate. Those who have experimented with all types of pointed bullets are well aware of the highly destructive effects which have been brought about by the so-called *spitze* bullet, first adopted by the Germans. It is doubtful if the pointed bullet of one army is more destructive than that of another.

Another remarkable feature of gunshot wounds in the present war is the large percentage of artillery wounds from shrapnel and high explosive shells, and to these might be added the wounds caused by bombs and hand grenades. Wounds from these projectiles are attended with a great deal of contusion, hematoma, lacerated and devitalized tissue. They are prone to extensive suppuration, which in turn makes their treatment difficult and laborious in active campaign.

The statistics of war wounds have been withheld by the censor, so that nothing is given with which comparison can be made, but assurance is given that results are satisfactory and that improvements in wound treatment are being made very rapidly.

The bacteriology of all wounds may be said to be one of environment, and for that reason the bacteriology of war wounds is similar to the bacteriology of the terrain on which the battle is fought. The amount of the infecting dose will depend upon the size and character of the wound and the degree of contamination of the skin and clothing. The operations on the western front are being conducted in farming districts in which the soil is richly manured with the fecal matter of animals and man. The consequence is that the virulent types of microbes which find their habitat in such refuse are very prevalent. Broadly speaking, the organisms found in the clothing, skin, and wounds of men are of the aerobic or facultative anaerobic kind, and also the strict anaerobes. The first include staphylococci, streptococci, bacillus pyocyaneus, and the members of the colon group, and to the second belong tetanus

bacillus, bacillus of malignant oedema, the bacillus aerogenes capsulatus of Welch, and the indeterminate series to which gas gangrene is attributed.

The exact rôle played by the colon group has not been determined. The action of staphylococci, streptococci, and other pyogenic organisms is well known. In their ranges in the tissues they contribute indirectly to the graver consequences of the action of certain anaerobes such as those concerned in the production of gas gangrene. The anaerobes have brought about tragic consequences in the present war and the efforts for prevention of infection have been directed against them more especially. The presence of pus is of no moment when compared to the clinical evidences of tetanus, malignant oedema, or gas gangrene.

The spore formation of these resistant organisms is of moment to the surgeon with regard to the sterilization of instruments and all materials used in the treatment of the wound proper. The spores of malignant oedema resist a temperature of 90° C. for a half hour. Those of bacillus perfringens require five minutes' boiling. The spores of tetanus in dry wound discharges remain virulent for many months and in this condition they become resistant, so that autoclaving is really the only effective way of killing them. In addition to their resistance to sterilization, the anaerobes elaborate toxins locally which do not enter the blood stream until late. This fact is of value to the surgeon, and the radical methods of wound treatment employed in all infected wounds at present are yielding excellent results.

Tetanus bacillus is the most important of the malignant anaerobes. The toxin is produced locally in the wound and is carried along the peripheral nerves to the central nervous system, especially to the cells of the medulla and pons, attaching itself first to the anterior cornual cells connected with the motor nerve supply of the wound area so that the first symptom of tetanus is a cramp in the injured limb.

The antitoxin is derived from the serum of horses that have been immunized against the toxin. The neutralizing effects of antitoxin with toxin is a mathematical process, the strength of a given antitoxin being estimated by the amount of it which is required to protect a given weight of animal against a simultaneous injection of a lethal dose of toxin; for instance, 1 cm. of the Pasteur Institute antitoxin will protect 1,000,000,000 grams of mouse against a lethal dose of tetanus toxin, and the therapeutic dose of this preparation is 50 to 100 ccm. The presence of tetanus is first heralded by the characteristic symptoms when it is too late to be effected much with antitoxin. It is much easier to prevent the union of tetanus toxin with nerve-cells than to unlock the combination after it has been made, hence the value of a prophylactic dose. One cannot go wrong by administering antitoxin at once when the nature of the soil where the wound was incurred is known, or the presence of bacteria such as bacillus aerogenes capsulatus or other spore-bearing



bacilli are found in the discharges. These are nearly always in association with bacillus tetanus—the latter is difficult to find in a wound.

If tetanus has developed, the dose may not be fatal, or there may yet be free toxin in the central nervous system which should be counteracted by antitoxin injected in the lumbar sac. A good plan is to give an injection of 10 to 15 ccm. of antitoxin in the lumbar sac and 100 ccm. intravenously in one or two injections as rapidly as possible after the onset of the symptoms. The additional intravenous dose insures a high concentration of antitoxin in the body fluids and a rapid and more intense action on the toxin. The administration of antitoxin must be supplemented by thorough eradication of the infected focus, since it is useless to administer antitoxin if tetanus bacilli are left in the wound.

The bacillus of malignant oedema is at times found in wounds, under suitable conditions. There is intense serous exudation in the muscles and subcutaneous tissues, the mechanical pressure of which, with the rapid development of the bacilli, cause obstruction of the vessels and resulting gangrene. It is possible to prepare an antitoxin against malignant oedema, but it has never been used therapeutically.

*Bacillus aerogenes capsulatus* (Welch) or, as it is sometimes called, *bacillus perfringens*, is frequently found in the wounds of this war in association with the bacillus tetanus. It causes free exudation of serum with abundant gas production. The resulting emphysema spreads rapidly, stripping up the cellular tissue, and permeating muscles. The mechanical pressure of the effusion and gas obstruct the circulation, with resulting gangrene.

While *bacillus aerogenes capsulatus* is the chief agent in the causation of gas gangrene, examination of wounds will at times reveal other gas-producing microbes. The latter are prone to appear in wounds where death has resulted from profound toxæmia. Pure infections of *bacillus aerogenes capsulatus* are not fatal as a rule. These additional organisms are of the anaerobic kind; they produce soluble toxins which are powerful depressants to the heart—a feature of the cases being clearness of mind with an imperceptible pulse.

The shattering effects of a shell-wound or the explosive effects of a wound from the military rifle at close range, in the thigh for instance, is a good example of the ideal conditions for anaerobic infection. The projectile carries soil contamination covering skin or clothes deeply into the tissues, shattering the bone, the fragments of which, acting as secondary projectiles, carry infection into pockets in different directions. The hæmatoma, contusion, laceration, and devitalized tissues provide for the growth of bacteria ideal conditions in a number of foci which are closed by prolapsed muscle and other tissues, and thereby rendered inaccessible to the air. The difficulty of removing the bacteria from such a wound and of preventing them from obtaining a foothold and elaborating their toxins must be obvious.

The bacteria can be removed from such a wound only by free drainage with frequent washing with antiseptics. The advantage of the flow of lymph promoted by such agents as hypertonic salines and "eusol" (hypochlorous acid) has been well demonstrated in this war. The use of eusol is particularly favored since it adds to its lymph lavage properties, that of being acid, which is in itself inimical to the production of toxins. It also opposes the absorption of toxins by the flow of lymph which it induces and by relieving the local tissues of exudate; it prevents the mechanical pressure on the vascular supply which is a contributing factor in preventing gangrene.

The use of vaccines against anaerobic infection is not attended with success. The patient is quickly overwhelmed by the toxins, long before the vaccines can have any effect. The rôle of vaccines lies more in building up resistance against pyogenic organisms, such as staphylococci and streptococci, in cases of long continued suppuration and fever.

The general condition of the wounded is dealt with largely from the standpoint of shock and in this especially the author is partial to the teachings of Crile, who believes that shock is a condition of exhaustion and low-blood-pressure, which may be caused by pain, hæmorrhage, sepsis, worry, and fear. He has shown that painful stimuli can reach the brain even in a state of general anæsthesia, causing exhaustion of the brain-cells. In consequence of brain-cell exhaustion, there is derangement of vaso-motor mechanism and lowered blood-pressure.

To prevent shock he prevents painful stimuli from reaching the brain-cells. Painful stimuli may reach brain-cells during general anæsthesia but they may be blocked by means of local anæsthesia. Crile has elaborated many methods of anoci-association, as it is called, all being attempts to guard the brain-cells from exhaustion by blocking the various paths of painful stimuli.

Aside from local anæsthesia the administration of morphine before operation is employed. This lowers the receptivity of the nerve-cell. Morphine is a sheet anchor in preventing shock given in  $\frac{1}{6}$ -gr. doses with  $\frac{1}{150}$  gr. of scopolamine which may be repeated if the patient shows by straining or rapid breathing that painful stimuli are still reaching his brain.

The next measure employed to prevent shock is to maintain the blood-pressure. This may be accomplished by pneumatic contrivances not suitable in war. Bandaging of the extremities is beneficial in failing circulation in the presence of shock.

The pressure may be maintained by transfusing blood (Crile), which is better than saline solution, which exudes from the vessels and may accumulate in loose tissues about the abdomen in sufficient quantities to embarrass respiration.

Adrenalin may be added to the solution to be transfused and pituitary extract in appropriate doses has been used. Crile says that strychnine stimulates the brain-cells and acts harmfully; alcohol is



not much better. Camphor and caffeine are used by some.

At the first-aid station the hæmorrhage should first be arrested; the gross soiling of the wound removed; first-aid dressing applied; morphine given to relieve pain and fixation applied wherever possible; the use of alcohol and strychnia should be avoided but the patient should be given hot tea or caffeine. Fluids should be given to sustain blood-pressure.

At the clearing hospital all serious wounds are re-dressed under an anæsthetic. Patients with compound fractures are incised to favor free drainage, and care should be taken to apply a well fitting splint that will not cause pain. When deemed necessary or advisable, it is well to use some form of regional anæsthesia. This may be practiced upon those who have been operated on or in severe fractures to avoid shock. The addition of potassium sulphate to the local anæsthesia solution will lengthen its effect. Morphia in transport is employed to ward off pain and shock. Its use protects the brain-cells from continued painful stimulation. Saline infusion with the addition of adrenalin is useful in shock after hæmorrhage, otherwise pituitary extract should be used.

At the base hospitals patients are examined as to their general condition, the temperature, and the pulse-rate. If they are comfortable, they should be allowed a period of rest unless there is evidence of gas-gangrene. Compound fractures are X-rayed, and when necessary to remove the dressings and splints, these should be reapplied under anæsthesia.

Extensive lacerated wounds, without fracture, should be put at once into a saline bath with the addition of eusol when the discharges are very offensive. This is good for sepsis and it avoids pain which follows frequent redressing.

Shock is prevented by warding off the conditions that cause it: pain, sepsis, and hæmorrhage.

Pain is relieved by proper dressing, proper fixation, and the use of morphine. Sepsis is avoided by ample drainage.

When shock is caused by loss of blood, saline solution should be administered at a temperature of 112° F. with 10 to 20 drops of adrenalin to the pint, into the rectum, cellular tissues, or a vein, if the symptoms are urgent.

Before operation morphine, gr.  $\frac{1}{4}$ , with atropine should be administered hypodermatically. If the patient is to undergo any severe operation, local and regional anæsthesia should be employed. For this purpose one may use infiltration with novocaine,  $\frac{1}{2}$  per cent, with adrenalin chloride added. If to this is added potassium sulphate, gr. 10, to each ounce, the anæsthetic effect is prolonged and pain after operation is lessened. The use of urea and quinine is sometimes employed by Crile for the same purpose in lieu of potassium sulphate. Instead of infiltration around the main nerve supply, infiltration in the cauda equina may be employed for the benefit of cases of operation on the lower extremities. In-

filtration of the tissues should be done with a large syringe so that force may be exerted to distend all the layers of tissue and this may be facilitated by making counterpressure with the hand.

Cutting with a sharp knife causes less shock than tearing tissues and all manipulation should be gentle. Oxygen may be used in collapse and the patient's head should be lowered.

After operation the usual methods to maintain blood-pressure and the strength of the patient should be resorted to.

In war the first treatment is the application of the first-aid dressing consisting of a cyanide gauze pad fixed to a bandage. It may have been applied by a regimental surgeon, but very often by a stretcher-bearer, a patient, or a comrade. This dressing has been of use only to prevent further infection of the wound from the skin and clothing.

Aside from the field dressing mentioned, the author is partial to the use of hydrochlorous acid which may be used as a powder, gas, or solution. The gas will penetrate and act at a distance. The powder and solution are harmless to the tissues and at the same time potent against bacteria and their spores. The effects of this antiseptic are purely local, and there is no danger to be apprehended from absorption. It promotes lymph lavage and controls fever. The powder can be introduced in the first field dressing. When water is available, it can be made into a solution for general use. The constituents of the powder are inexpensive and easily procured, and its preparation is very simple.

The removal of the first-aid dressing is done at the field ambulance at the earliest moment practicable, the earlier the better. In superficial wounds the dressing is removed by the surgeon who wears rubber gloves; the parts are cleansed with ether and then laid on a clean towel. The surrounding surface and wound are painted with a 2.5-per-cent solution of iodine, and the wound is then dressed with cyanide gauze.

A wet dressing is used in more extensive, foul wounds and a large drainage tube should be placed in the depth of the wound. Deep wounds may require drainage by counteropenings and the use of immobilization is always in order for fractures and extensive wounds.

The application of dilute antiseptics to a wound will only reach the organisms that are disposed on the surface. In order to reach deep infections, one has to practice thorough drainage and wash out the remote recesses with weak antiseptic solutions, such as a 2-per-cent tincture of iodine, 2.5-per-cent carbolic acid, lisol, one dram to the pint, or bichloride of mercury in dilute form.

Ample drainage with the application of hydrochlorous acid in the form of eupad or repeated irrigations with eusol has proven one of the most efficacious agents in the penetration of anaerobic infection in the present war.

Eupad is a powder consisting of equal weights of bleaching powder and powdered boric acid inti-



mately mixed. Wounds which are packed with gauze impregnated with the powder are stimulated by the escape of hydrochloric acid gas, which is a powerful antiseptic. Congestion and œdema are produced. After a few applications the antiseptic is removed and hypertonic salt solution is substituted.

Eusol is prepared by shaking up 25 gm. of eupad with one liter of water; after standing for a few hours the solution is then filtered through cloth or filter paper.

Another way of preparing the solution is as follows: To one liter of water add 12.5 gm. of boric acid powder and shake again; allow to stand for some time, preferably over night, then filter off, and the clear solution is ready for use.

The method of using the two forms of hypochlorous acid in accordance with present experience is as follows:

1. Eusol, which is a standard strength of approximately 0.5 per cent hypochlorous acid, may be used (a) as a solution diluted with water or normal salt; (b) as a fomentation covered with a water-proof covering; (c) on gauze without a water-proof covering; (d) as a bath, full strength or diluted.

2. Eupad is used when it is desired to apply a more concentrated antiseptic as follows: The wound is packed with gauze with the powder between the layers when the fabric is dampened with water. The dressing is then covered with wool and a bandage applied as above and covered with a water-proof covering for only 10 to 20 minutes as a rule. When pain occurs a weaker application should be employed on strands of gauze or wool impregnated with the powder and used as drainage or as a dusting powder on septic sores.

The general principle of the antiseptic application is to secure a maximum antiseptic effect with a minimum amount of irritation. To this end the solution may be increased or diminished in strength. As to the local effects of the powder, this is to be regulated by the additional amount of the powder that may be dusted on the wet gauze.

Experience shows that 0.5 per cent eusol is apt to irritate the skin or tissues, but the irritation is of short duration because it is warded off by contact with albuminous substances. To obtain continuous antiseptic action the wound should be washed out with eusol solution 0.5 per cent in every cavity of the injured part. Perforated rubber tubes 6 mm. in diameter covered with bath toweling are led to every pocket of the wound. In case of compound fractures, the tubes are carried to the area of fracture and their ends lie among the fragments. The wound is then filled with gauze covered with non-absorbent cotton through which the tubes project. Either continuous irrigation is employed or eusol solution is run into the tubes every hour.

In the more successful cases the wound will become aseptic in from 3 to 5 days and the edges can then be brought together with strips of plaster. Septic compound fractures treated by this method

become clean and can be made to heal like aseptic fractures.

The principle element of treatment of large septic wounds is the establishment of adequate drainage and the removal of foreign bodies and dead tissue. The latter may be removed by cutting away with scissors or by curetting. The whole wound may be excised with advantage in some cases.

Wound drainage, an important factor in the treatment of wounds, is practiced more satisfactorily at the base hospitals. The drainage should be provided with all necessary counteropenings. Rubber drainage tubes are preferable to gauze drains, which are apt to clog. Loose woven cotton bandage is better than gauze. One end of the bandage is placed in the wound and the other is carried in a bowl containing a little saline solution. The wound is kept wet either by an irrigation drip or by frequently pouring saline into the wound, and when a dependent counteropening has been made a split rubber drainage tube is passed through the wound and the bandage is made to slip along side of this tube.

Irrigation of wounds insures a more steady method of freeing the wound of toxic matter, and to this end the osmotic action of hypertonic solutions is taken advantage of. The flow of saline in and out of the wound continuously removes the film of toxic matter and thereby limits toxic absorption. The wounds found most suitable for treatment by continuous irrigation are compound fractures and deep septic wounds, especially of the upper arm and thigh. Fomentations of hot boric acid may be alternated at times with the other methods of treatment, especially when the wounds become sluggish in healing.

The bath treatment of wounds induces healing by increasing the blood supply to the part. Regions like the face, rich in blood supply, heal faster than other parts, like the feet for instance. Hypertonic solution has to a great extent replaced the antiseptic bath and it is ideal for wounds of the limbs below the elbow and knee. Continued too long it renders the tissues sodden and is tiring to the patient, and it is not practiced with patients in a serious condition. The bath may be alternated with fomentations at night or it may be replaced by irrigations in the day.

The open treatment of wounds consists in placing a layer of wet gauze over the wound in lieu of the old gauze, wool, and bandage which acts as a septic poultice.

*Treatment of septic wounds by excision.* The treatment of compound fractures, cranial and joint wounds has been very much modified by the employment of excision. The sooner the excision is made the better, because later a large bank of inflamed infected tissue surrounds the wound. In such cases hypertonic solution will render the wound ready for operation in 24 to 48 hours. Contra-indications to excision are: marked pocketing in the wound and the exposure of vascular or nerve-trunks or of bone which it is inadvisable to remove. In any case excision of the soiled edges of the skin, superficial tissue, and



muscle may be done with advantage and the healing process is very much accelerated. Prominences of bone may be removed. If any septic focus is left behind the method will be a failure.

The technique of operation is very important, and it is explained as follows by its author:

"The operation can usually be done under infiltration anæsthesia of the neighboring parts. It is well to add plenty of adrenalin to the anæsthetic solution so that hæmorrhage during the operation is avoided. Accurate hæmostasis is important for success. The parts should be shaved and disinfected very thoroughly; the wound is then wiped out and packed with gauze.

"For disinfection in these cases I favor the use of very strong iodine solution, 5 or 10 per cent in spirits or ether. This is painted thoroughly in every part of the wound and over the surrounding skin for a considerable area. It has the effect of drying the surface of the wound in a remarkable manner. The strong iodine is wiped off the skin with spirits or ether at the end of the operation.

"The skin close to each extremity of the wound is caught by a tissue forceps or loop of thread and slight traction is made in a direction away from the center of the wound at an angle of about 45° with the sound skin. The whole is then cut away *en masse* (skin, flesh and, if necessary, bone) at a distance of one-third to one inch from the raw surface. Care must be taken that pockets or general surfaces of the wound are not cut into during the procedure. Bony prominences are removed along with the soft parts by dividing them with bone pliers, gouge forceps, or chisel. If the wound is deep, it is sometimes of advantage to insert the finger into it as a guide to a point where the tissue must be divided. A very sharp scalpel is invaluable. Cutting out the wound in pieces makes the results doubtful.

"The wound surfaces should then be washed out with saline solution and packed with gauze and the surrounding skin wiped free from blood or discharge. Fresh towels, fresh instruments and, if the wound has been handled, fresh gloves, should now be used.

"The wound should be closed by wide sutures which under-run its floor so that no dead spaces are left. It may be necessary to suture in layers. If so, the suture of each layer should include the tissue of the deep layer. The skin should be accurately approximated by a few fine sutures. Further relaxation sutures are not often necessary.

"The following dressing should then be applied; the line of sutures and the adjacent skin for several inches should be painted with a wound varnish of which mastic, dissolved in some rapidly evaporating solvent, forms the important part—40 to 50 per cent. When the varnish has become sticky—after 1.5 to 2 minutes—a covering of gauze at least two layers thick, should be stretched tightly and smoothly over the sticky area, gently patted down, and cotton wool and bandages applied with moderate firmness. If it is necessary to inspect the wound at

any time, after removing the bandage and the wool, the top layer or layers of gauze should be peeled off by traction at right angles to the surface, the layer next to the skin and wound being at the same time retained by the other hand. Perfectly satisfactory inspection can be made through the single layer of gauze. The loose edges of the gauze should be neatly trimmed. In many cases no further treatment is required until the stitches are to be removed. The final layer of gauze is then peeled off.

"If catgut sutures have been used for the skin, it is often found that the knots come away with the layer of gauze, the deeper parts having been digested. A fresh application of the mastic varnish and gauze should then be made and left until the wound is firmly healed. The varnish should on no account be painted over the gauze after it has been applied, as the gauze could not then be peeled off as described. The varnish and gauze dressing is important for success. It is the best I know. It gives wide support, relieves tension, and prevents any dragging on the stitches. These factors are of great value in preventing stitch abscess."

The reviewer has noted the plan of wound management at the front and on the line of communication quite literally with the text in the first pages of this valuable book, because the matter presents in a concise way the leading points in the treatment of war wounds.

Succeeding pages are devoted to (1) the removal of foreign bodies, (2) gangrene, and (3) the treatment of gunshot wounds of the different body regions.

The book is altogether the most valuable contribution to war surgery that the reviewer has yet seen and it is recommended for the use of surgeons in military practice and in civil hospitals as well.

LOUIS A. LAGARDE.

**Clermont: Treatment of Wounds by the Method of Carrel** (*Traitement des plaies par la méthode de Carrel*). *Presse méd.*, 1916, p. 180.

Clermont has put Carrel's method into practice in his ambulance service. The number treated is too small to arrive at definite conclusions, but his impression is that the method is superior to any of those currently employed. In wounds he has treated, including fractures of the limbs, the evolution has been remarkably simple. Where there were delays they were due either to faulty technique or to particles of projectiles still remaining as was demonstrated by radiograph. Sometimes when it was not possible to make continuous instillations he has made injections of Dakin's liquid every hour into the drains and has had excellent results.

W. A. BRENNAN.

**Stutzin and Diesing: Statistics of 222 War Surgical Interventions** (*Statistisches ueber 222 Kriegschirurgische Eingriffe*). *Deutsche med. Wchnschr.*, 1916, xlii, 190.

The authors' statistics refer to the period from Sept. 18 to Dec. 9, 1915, in the Reserve Red Cross

Hospital at Constantinople, during which time they made 222 surgical interventions.

Among the 222 operations were: 19 amputations, 4 of the upper arm, 11 of the thigh, 4 of the lower leg; 16 resections, 5 of the knee-joint, 6 of the ankle-joint, 3 of the shoulder-joint, 1 of the elbow, 1 of the wrist; 3 exarticulations, 1 of the phalanges of the thumb, 2 of the shoulder-joint; 11 cranial trepanations; 4 vascular operations (ligature of the brachial), 2 for peripheric septic hæmorrhages, 2 previous to exarticulation operations; 2 resections of ribs; 5 laparotomies (3 of these cystotomies); 2 enucleations of the eye.

The other cases included incisions, currettings, sequestrotomies, luxation, reductions, etc. There were also some epididymectomies, and testicle resections for infections. The operative mortality was 11.25 per cent, 25 deaths. In the 19 amputations 8 died, 42.2 per cent—2 upper arms, 3 thigh, 3 lower leg. Of the 16 resections, 2 died, 11.75 per cent—1 of the knee-joint, 1 of the shoulder. Of the laparotomies, 1 died, 20 per cent. Of the trepanations, 3 died, 27.2 per cent. The other 11 deaths were in typical operations and are not specially enumerated.

There were 6 cases of gaseous gangrene, 4 of cerebral abscess, 26 suppurating fractures, 1 case of projectile extracted from the bladder. As a general rule all these wounded arrive in the hospital in a more or less infected condition. Of the cases of gaseous gangrene 3 occurred in amputations, 1 with amyloid degeneration for empyema. In one case it was necessary to amputate 2 days after a resection. The authors think that in cases of doubt between resection and amputation, as the organic resistance is very low, it is better to resort to amputation at first because it is better to lose a limb than a man.\*

W. A. BRENNAN.

**Lériché, R.: Integral Operative Statistics of Surgical Service at the Rear** (Statistiques opératoires intégrales d'un service de chirurgie de l'arrière). *Lyon chir.*, 1916, xiii, 193.

In the two rear hospitals of which Lériché had charge 199 wounded were received between September 26th, and October 15th, 1915. All those received and operated upon within twenty-four hours of injury recovered. The others were mostly received from two to five days from the time of injury and of these 7 died.

All the wounded had received antitetanic serum at the front. All later received a second injection and even a third where there was a late intervention. No case of tetanus developed.

There was only one case of gaseous gangrene. This was in a man who had lain five days on the field. He was cured.

Of 188 cases which the author considers definitely cured, 133 have recovered their physical strength almost completely, 55 have a physical value more or less diminished—loss of a limb, eye, etc.

W. A. BRENNAN.

**Cutler, F. J.: The Surgical Disabilities of Troops in Training.** *Practitioner*, Lond., 1916, xcvi, 559.

A large number of mutilating gunshot wounds of the face have occurred during the present war. Many of these have been complicated by fracture of the mandible. The usual method of treatment is by wire splints fastening the teeth in position. So many of these cases, however, result in loss of bone, either from immediate destruction or from subsequent infection, that it is often necessary to fill in a considerable gap in the mandible. This is best accomplished by transplantation of bone. The wounds must have soundly healed and all septic or damaged teeth removed from the neighborhood of the fracture some time previously. A portion of a rib is then accurately fitted into the gap, fastening it there either by wire tacks or by silver wire.

It would seem that this transplant acts mainly as a scaffold for the new bone-forming cells, but a case reported by Albee would indicate that the transplants themselves have power of bone degeneration.

J. H. SKILES.

**Latarjet, A.: The Working of a Clearing Ambulance** (Le fonctionnement d'une ambulance). *Lyon chir.*, 1916, xiii, 166.

The author gives very interesting particulars of the surgical work done in a field ambulance during a period of offensive. To this ambulance service was assigned the work of receiving all the wounded from an army corps. During the 5 days of attack, 9,328 wounded were disposed of. Of these, 5,011 were slightly wounded, and 4,317 had more or less grave wounds.

Of the 5,011 slightly wounded, 656 were immediately dispatched to the clearing hospital. The remaining 4,355 were examined and had their wounds dressed. These wounds comprised:

Head and neck.....	732
Thorax.....	354
Abdomen.....	102
Upper limbs.....	1600
Lower limbs.....	1330
Multiple wounds.....	46
Shock.....	191

After the wounds were dressed these men were sent on to the clearing hospitals at the base. The 4,317 injuries of the seriously wounded were as follows:

Head.....	516
Neck.....	96
Thorax.....	531
Abdomen.....	267
Upper limb.....	816
Lower limb.....	1443
Spine.....	18
Genital organs.....	24
Multiple wounds.....	565
Gas intoxication, etc.....	41

Of these 4,317, 108 died during the period within five days, mostly a few hours after arrival and with-



out intervention. Sixty-three died while being conveyed from the field to the ambulance. The total immediate mortality was 254.

Of the 531 thoracic wounds, 176 were shell wounds, 132 bullet, and 20 bomb wounds. Twenty-three died between the first and third day from hæmorrhage or shock; 16 died from the fourth to twelfth day. Of the 267 abdominal wounds, 124 were penetrating. Two hundred and fifty-four of the wounded, intransportable and inoperable, were hospitalized on the spot. The others were dispatched to the clearing base hospitals, either by auto or train.

Hospitalization within a few hours of injury, immediate large evacuation of wounds, and evacuation only toward the interior when the patients are in a fair way to recover are the ends to be sought if lamentable consequences are to be avoided.

W. A. BRENNAN.

### SURGICAL PATHOLOGY

**Bristol, L. D.: Free Tumor Diagnosis as a Function of State Public Health Laboratories.** *J. Am. M. Ass.*, 1916, lxvi, 1678.

The results of investigation show that for pathologic examinations in state laboratories of the 48 states 24 have facilities for the diagnosis of suspected cancerous tissue either in their state public health laboratory or in some other state institution, while 24 do not attempt such work.

Of the 24 states which have facilities for making tumor diagnoses, 5 charge specified fees, 6 charge all persons except indigents, and 13 make no charge in any case.

From information available, it seems that opinions of authorities differ somewhat as to whether or not tumor diagnoses should be made free of charge either by state public health laboratories or other institutions, as an important aid in the campaign against cancer.

The chief arguments received against the free diagnosis of tumor tissue in state laboratories are as follows:

1. Diagnosis of tissue for cancer is merely a private consultation and is not regarded as public health work.

2. The plan would savor too much of state medicine.

3. As a rule, the appropriation for the state laboratory does not warrant the doing of more work, and tumor diagnosis should not interfere with the diagnosis of the so-called communicable diseases.

4. There is danger of spreading cancer-cells into other parts of the body by the excision of small specimens for diagnosis.

The following recommendations are submitted as worthy of consideration in the campaign against cancer:

1. So far as consistent with local conditions facilities should be offered under public auspices in each state for the diagnosis of tissue suspected

of being cancerous. Preferably, these should be made free of charge.

2. The logical place for doing such work is the laboratory of the state health department. It is not to be supposed that such work will be given preference over other work now being done by these laboratories.

3. To cover this work, in those states which have no such facilities, additional money should be appropriated.

4. Judgment must always be used by surgeons in the removal of suspected cancerous tissue for diagnosis and the value of a microscopic diagnosis should appear to outweigh the risk involved before such a procedure is adopted.

EDWARD L. CORNELL.

**Birtch, F. W.: A Group Study Plan for a Diagnostic Team Acting as a Laboratory for the Profession.** *J. Am. M. Ass.*, 1916, lxvi, 1672.

St. Luke's Hospital, San Francisco, is the only institution reported to have organized specialists to act as a laboratory for diagnostic purposes, returning the patient after investigation to the referring physician with a protocol of the findings and recommendations for the treatment of the case.

This new era in medicine is very young; the medical universities are not yet teaching this type of medicine; they have not even accepted it and, in fact, there is no definite instruction to be had on the subject. The method of group study now employed in hospitals, by referring the patient from one department to another without joint discussion of cases by the heads of these departments, is open to as severe criticism as that which Doctor Cabot applied to the methods of the general practitioners.

It has not been long realized that the three great classes of patients, the rich, the poor, and the middle class, are receiving quite different medical attention. The rich man, while he is able to pay for the services of a large number of high-priced specialists, presumably gets the best medical consideration, but, unfortunately, the highly paid specialists are individuals who are not organized and their work is not correlated, consequently, consultations are often perfunctory and unsatisfactory to both physician and patient.

The diagnostic section of St. Luke's Hospital, San Francisco, consists of ten men, each having special training along some particular line. The members of the profession refer obscure cases to this section for diagnosis. These patients are placed in the hospital for observation and each member of the diagnostic team makes an individual examination and a written report of his findings. At noon each day the team meets to discuss the cases. If the case is not clear at the first consultation, further investigation is recommended and any new discoveries are reported the following day. This method of procedure is continued day after day until some conclusion is reached. The physician

who referred the case is asked to be present at all of these consultations. Finally the patient is referred back and a written report of the findings and recommendations for treatment are mailed to the attending physician. Thus the specialists make of themselves a diagnostic laboratory.

All of this work is being done by the diagnostic team for a fee commensurate with the patient's income. The amount collected is not sufficient to pay for the time of the clinicians. However, the good that is being accomplished by this method of study and the educational returns for each member of the team in daily discussion with his colleagues amply repays the clinicians.

The success of a plan of this kind depends, briefly, on the following conditions: The diagnostic team must accept, from the profession, cases for investigation at a price consistent with the income of the patient; cases should be examined by all the members of the team; the results of their findings must be written; the specialists meet in daily consultation over the cases, and investigations continue until all possible evidence is discovered. The case is returned to the physician who sent it and a report is mailed, together with the conclusions and suggestions for treatment.

The results to be expected from such a scheme are these: The general practitioner will gladly accept it; the good influence of the family physician will be preserved; medical men in the community will take advantage of the daily discussions and gradually broaden their point of view of medicine; this method of group study will maintain the advantages of specialism and do away with the disadvantages. Clinical reports from this work bearing on these predictions are now being prepared for publication.

EDWARD L. CORNELL.

**Binnie, J. F.: The Rôle of the Sympathetic System in the Diagnosis of Abdominal Diseases.**  
*Am. J. M. Sc.*, 1916, cli, 652.

The phenomenon of pain or tenderness in acute abdominal diseases occurring in a situation different from the diseased organ, for example, the median line pain in early appendicitis — commonly spoken of as "reflex pain" — is explained by the author on the basis of development and physiology of the sympathetic nerve supply of the region.

Reviewing the embryology of the abdominal viscera, he points out the median position of organs (and therefore of the nerves supplying them), which later migrate to lateral positions, but their nerve supply maintains the original median connections. The anatomy of the abdominal and thoracic sympathetic system is reviewed in detail and its connections with spinal nerves, pneumogastric, phrenic, etc., are recalled. Periumbilical pain in the peritonitis is explained through the distribution of the right phrenic nerve which sends fibers to the diaphragm, liver, and anterior parietal peritoneum as low as the umbilicus. The connections of the right phrenic with the lower intercostal

nerves, through the diaphragmatic plexus, explain right-sided abdominal pain in thoracic diseases, e.g., empyema or pneumonia.

Referred pain is due to the increased number of afferent impulses from an irritated organ coming to the nerve-center, which is unable to handle them in the normal way and the result is a radiation of the efferent impulses along the trunks of the sensory nerves, passing near the center, giving rise to a sensation of pain at the nerve-endings. If a motor path is affected, the result will be muscular rigidity.

The phenomenon of crossed pain, tenderness of the superficial sensory nerves, difference in protopathic and epicritic sensibility in abdominal inflammations with the resulting clinical signs, are described in detail.

The author discusses the more recent work by neurologists on the causes and nature of abdominal pain due to irritation, distention, etc., and explains the origin of secondary pain or that arising through extension of the irritation beyond the organ first affected.

That renal pain is not midline is due to the lateral development of the kidney. Renal irritation, as in stone, therefore does not give rise to epigastric pain. The occurrence of atonic contraction of the anal sphincter, due to renal irritation and causing symptoms of intestinal obstruction, is explained; also the rôle of the sympathetic system and the phenomenon of radiation in genito-urinary organs, especially in prostatic disease, is elucidated.

HORACE BINNEY.

**Stoddard, J. L., and Cutler, E. C.: Torula Infection in Man.** *Monographs of Rockefeller Institute for Med. Research*, 1916, No. 6, Jan., 31.

Two cases from the Cushing's clinic at the Peter Bent Brigham Hospital presented at autopsy unusual lesions in the brain and meninges. The histories and physical examinations included such signs of cerebral tumor as to indicate decompression or exploratory operation, but the pathological examination in each case proved the complete absence of tumor. Lesions were found, however, which fully explained the clinical symptoms and physical signs. Enormous numbers of organisms having many points of resemblance to those of blastomycosis occurred in all of the lesions in such a manner as to leave no doubt of their casual relations. Certain differences from the usual descriptions of the organisms of the blastomycosis group and their lesions made a careful study necessary to determine the relations of the authors' cases.

Two problems which have received increasing attention in late years, without great progress toward their solution, were thus brought to the author's notice by the study of the cases; i.e., the problem of cerebral pseudotumor, and the problem of the relationships of the lower fungi forming the group called blastomycosis. It seemed probable to the authors that their cases might throw light upon both these questions.



In the study of the first problem, that of pseudotumor cerebri, the literature furnished a considerable number of cases in which symptoms and signs of brain tumor existed for a short or long time, with subsequent recovery, or with indefinite autopsy findings.

In trying to solve the other problem, that of the relationship of the organisms of the blastomycosis group, they studied the literature and made animal experiments. In their experiments they used pure cultures of three different organisms; one isolated from a human case of cutaneous blastomycosis, one from a human case of coccidioidal granuloma, and one from Frothingham's case of torula infection in a horse. Inoculations were made in various ways upon several species of laboratory animals, and agglutination experiments done upon the infected animals.

One of the problems in the authors' work was the relationship of the organisms causing the diseases termed blastomycoses. They have shown the confusion existing in textbooks, where the various diseases are described as one disease or as different manifestations of the action of a single organism in different states. The study of the literature convinced them that coccidioidal granuloma was a disease distinct clinically, pathologically, and biologically from other diseases called blastomycosis. Having decided that coccidioidal granuloma was a distinct disease, they turned their attention to the blastomycoses. They found in the literature two cases of skin and general infection produced by a true yeast with endospores in culture. Both cases were observed by Buschke, and appeared to be distinct from the American cutaneous disease. Frothingham's discovery of torula infection in a horse indicated another type, but no such cases had been reported in human beings.

The authors' cases were distinct from the larger part of the reported cases of blastomycosis in their clinical histories and pathology. It did not seem improbable to them that in the early study of blastomycosis such cases had been described, but their nature not recognized. They studied the original reports of all the cases of systemic blastomycosis and found that nearly all the cases were similar, so far as could be ascertained from the printed reports, except those involving the brain. Among

these there were obvious differences. First there were six cases like the other systemic cases, but in which the brain became involved as part of the general infection, which always included skin manifestations and often bone lesions. The symptomatology was not perceptibly influenced by the brain lesions. The pathology of the brain lesions resembled that of the other lesions. Different from these were four cases in which there were no skin lesions, but in which a general infection occurred with brain lesions which caused the predominating symptoms. Pathologically the lesions were distinct in many ways; but principally in the extension by solution of tissue, the always chronic reaction, and the production of a gelatinous material in the lesions.

Their first case was evidently identical with this latter group. Their second case was not fully identifiable by the study of the literature alone, for the peculiar intracerebral lesions were not present, and the parasites occurred in greater numbers of small forms. Such forms occurred in the meninges of the first case, but not in the intracerebral lesions, and were not described in the literature. In the experimental meningitis in a mouse produced by the injection of a culture of the ventricular fluid from the second case, however, large organisms were produced, identical with those of the first case, and intracerebral lesions of the same type were seen in process of formation. Thus their two cases proved to be alike in origin. Frothingham's case of torula infection was evidently the type of infection of these cases. In their animal experiments with torula the authors found both forms of parasites present in the lesions in varying proportions according to the extent and activity of the process. In a very active lesion enormous numbers of small organisms similar to those of the second case occurred; these were seen especially in the meningeal lesions. In older lesions, tending toward recovery, or in those slowly progressing, and in the higher animals, the larger forms predominated. In sections of the original horse lesions, small forms were entirely absent. Their experiments resulted in the production of all the variations in lesions and organisms seen in the cases. The animal experiments thus provided the necessary steps for the clear correlation of all the human cases as cases of torula infection.

GEORGE E. BEILBY.

# GYNECOLOGY

## UTERUS

**Stein, A.: The X-Ray Treatment of Uterine Myomata; a Warning Based on a Study of the Literature.** *Med. Rec.*, 1916, lxxxix, 991.

Stein sounds a warning to the enthusiast on the X-ray treatment of uterine myomata and has thoroughly reviewed the literature of this subject, citing numerous instances to substantiate his contention that the X-ray does not accomplish all that is claimed for it.

Since according to Klein, 7.7 per cent of uterine myomata show malignant degeneration in some form, how is it to be determined whether one is radiating a malignant tumor or a simple myoma? As a matter of fact, the author continues, at the present state of our radiological knowledge we have a perfect right to take "for granted that the X-rays may set up proliferative changes of a degenerative character in those areas of a radiated myoma which are not destroyed by the treatment." Furthermore, women in the child-bearing age may have their functioning ovaries badly crippled or even destroyed, thus endangering later offspring through changes of the germ plasma produced by extensive radiation. Sterility is common following long exposure to the X-rays.

The author calls attention to the difficulty in selecting suitable cases for radiotherapy and cites a case of interstitial pregnancy with profuse hæmorrhage who was given the choice between radiation or operation for myoma of the uterus. Fortunately the patient chose operation. She made an uneventful recovery, whereas, otherwise a rupture of her interstitial pregnancy might have meant sudden death.

Injuries directly traceable to the X-ray treatment of intra-abdominal lesions are practically unavoidable. Multiple peritoneal adhesions; deep ulcers of the abdominal skin; sclerotic changes of the pelvic connective tissues; irritative conditions of the bowel and bladder; atrophy of the gastro-intestinal glands are conditions of lesser importance which may result from continued radiation.

In conclusion the author says "judiciously restrained the indications for the X-ray treatment of uterine myomata are very limited, including besides myoma patients who have reached the climacteric, those suffering in addition from diabetes, obesity, advanced arteriosclerosis or hæmophilia, in whom surgical interference involves serious danger to life."

HARVEY B. MATTHEWS.

**Crossen, H. S.: Choice of Operation in the Various Classes of Cases of Retrodisplacement of the Uterus.** *J. Mo. St. M. Ass.*, 1916, xiii, 269.

The author has endeavored to make clear the method which should be employed to hold the uterus in anterior position.

A dependable presentation of this subject implies a careful consideration of the various operative measures devised and their adaptability to the correction of the pathologic condition present in different patients. There is considerable confusion at the present time and for the very good reason that there are certain factors in uterine support not yet fully understood even in physiologic conditions and much less in pathologic conditions.

The following, according to the author, may be taken as a safe working basis:

1. Most of the symptoms in retrodisplacement of the uterus are due to complicating conditions. Therefore such conditions must be treated first and the treatment of the retrodisplacement will depend to a large extent upon the complications.

2. Normally the uterus is held in position by a combination of structures. Therefore, in any scheme of restoration, either this combination support must be restored or other structures utilized to bring about a similar support.

3. Pelvic floor support is absolutely necessary to the permanent correction of any retrodisplacement.

4. When decided prolapse of the uterus can be excluded, the problem, after treatment of the complications, resolves itself into maintaining the corpus uteri in the anterior position and the cervix in the posterior position of the pelvis, with sufficient elevation of the uterus and adnexa to prevent dragging on hypersensitive attachments.

5. As this problem varies with the different pathological conditions present, it is advisable for purposes of study and comparison to group the cases into classes somewhat as follows:

A. Future pregnancy possible.

- (1) Adnexa intact—tissues freely movable.

- (2) Ovary and tube of one side removed.

- (3) Tube only removed.

- (4) Ovary only removed.

- (5) Diffuse tissue infiltration, fixing ligaments.

- (6) Varicose veins of the broad ligaments.

- (7) Cervix too far back.

B. Pregnancy not possible.

- (1) Active uterus preserved.

- (2) Senile uterus preserved.

6. For maintaining the corpus uteri in the anterior position there are a number of fairly satisfactory intra-abdominal methods which utilize one or more of the ligaments supporting the uterus.

7. In general, it may be stated that vaginal operations for retrodisplacement is indicated in those cases where other deep vaginal work is needed and lesions requiring abdominal section can be eliminated.

HARVEY B. MATTHEWS.



## ADNEXAL AND PERIUTERINE CONDITIONS

Heineberg, A.: Tubal Sterilization; Pregnancy Following Bilateral Salpingectomy; a Report of Two Cases and a Complete Review of the Literature. *N. Y. M. J.*, 1916, ciii, 107.

The author reports two cases of pregnancy following bilateral salpingectomy where the tubal stumps were merely ligated. With this report he presents a careful review of the subject in its surgical phase, discussing the various surgical procedures that have been developed.

He offers the following conclusions:

1. There is no method of tubal sterilization which affords absolute security against conception.

2. Simple ligation of the fallopian tubes with either single or double ligatures has been followed by the largest number of reported failures.

3. Excision of a wedge-shaped section from each cornu of the uterus, followed by careful closure of the opening with musculomuscular and seroserosus sutures has yielded better results than any other method.

4. In the light of our present knowledge it seems unwise to advocate any other method than cornual resection. The conclusions are in accord with those arrived at in previous reviews of this subject.

CAREY CULBERTSON.

Long, J. W.: Shirring the Round Ligaments. *Ann. Surg., Phila.*, 1916, lxiii, 690.

To the multitude of operations already devised for the correction of backward displacement of the uterus, the author adds another, for which he claims simplicity and efficiency. It consists in grasping the round ligament near its middle with a forceps and making traction upon the distal portion. While this tension is held, a round needle, armed with linen or silk, is thrust through the ligament close to the pelvic brim, just as it leaves the inguinal canal. The needle is then put through the ligament by an over-and-over stitch about every quarter of an inch until a sufficient amount of the ligature to insure a proper degree of shortening has been included, the last puncture of the needle usually passing through that portion which has been traumatized by the forceps. By pulling the two ends of the ligature together, the ligament is shirred, and the necessary shortening produced. In addition to this, the author has found that traction on the suture develops a small *mesoligament*, which springs from the pelvic wall. This piece of peritoneum may be well utilized to cover over the shirred portion of the ligament. The same suture may be used for the entire operation.

GATEWOOD.

## EXTERNAL GENITALIA

Gittings, J. C., Hamill, S. M., and others: A Report of the Committee on Vaginitis. *Arch. Pediat.*, 1916, xxxiii, 361.

This committee, appointed to investigate the subject of vaginitis in infants and young girls,

conducted a very thorough investigation. A questionnaire was sent to various institutions caring for female children and to a large number of pediatricians. With these replies as a basis they formulated the following set of resolutions:

1. That cities be required to provide adequate hospital and dispensary facilities for the care and treatment of children having vaginitis.

2. That matrons be placed in charge of the girls' toilet rooms in public schools.

3. That toilet seats, embodying the principle of the U-shape, be used in all schools and that the toilets be of proper height for different ages.

4. That city and state laboratories be empowered and equipped to make bacteriologic examinations for physicians when patients cannot afford to pay a private laboratory fee.

5. That educational literature on the subject of vaginitis be prepared and distributed to mothers through the medium of physicians, hospitals, dispensaries, health centers, municipal and visiting nurses.

6. That asylums for children and day nurseries be licensed and that the license be not granted unless, first, the institution has adequate facilities for the recognition of gonococcus vaginitis, and, second, that the institution exclude children having this disease if they cannot be properly isolated.

7. That separate wards be maintained in hospitals for the treatment of children with vaginitis who are also suffering from other diseases.

8. That microscopic examinations of smears be made before admission to the general wards of the hospital. In securing material for the smears, extreme care should be taken to observe rigid aseptic precautions.

9. That observation wards be provided.

10. That individual syringes, bed-pans, catheters, clinical thermometers, thermometer lubricant, wash basins, soap, powder, wash cloths, and towels be provided.

11. That single service diapers be used (at least for girls); or that diapers be sterilized in an autoclave at 15 pounds pressure for five minutes.

12. That nurses be required to make daily inspection of the vulva of each at the time of bathing and to report immediately the presence of the slightest suggestion of a vaginal discharge.

13. That low toilets be provided and equipped with seats embodying the principle of the U-shape.

14. That for routine purposes, the spray be used in place of tub-baths for the bathing of young girls and that older girls be sponged in bed.

15. That nurses receive special instruction as to the nature of vaginitis, the ease with which it is transmitted, the methods of preventing its spread, and the necessity for rigid aseptic surgical technique in its handling and treatment.

16. That a dispensary with special facilities for the treatment of gonococcus vaginitis be provided.

17. That nursing care and supervision be given in the home.



18. That mothers be instructed as to the dangers of vaginitis, the manner in which it is transmitted, the best method of protecting other children, and the necessity of prolonged observation.

19. That all cases of vaginitis under observation be voluntarily reported to the local health officer in states or cities where no legal requirements are in force.

EDWARD L. CORNELL.

#### MISCELLANEOUS

**Watkins, T. J.: Diagnosis in Gynecology.** Chicago *M. Recorder*, 1916, xxxviii, 309.

An analysis of abdominal palpation shows that it is always relative, that the findings are estimated by comparing the resistance to pressure over various areas of tissues or organs. By comparison only can a very soft pregnant uterus, a distended bladder, or a cyst with fluid wall be at times detected by palpation. The palpation should always be light, as firm pressure lessens the tactile sense, causes pain and excites rigidity. Observation of the facial expression is of great value when palpating for tenderness.

The technique of kidney palpation consists in the use of delicate vibratory palpation, such as is employed in bimanual examination of the uterus and ovaries. One hand is placed just below the ribs posteriorly and presses the kidney gently forward; with the other hand delicate vibratory counter-pressure is made anteriorly over the region of the kidney.

Greater tenderness over the region of the appendix than over the corresponding region on the opposite side is diagnostic of chronic appendicitis, other demonstrable pathology being excluded. Absence of tenderness does not exclude appendicitis, as gross pathologic changes in the appendix are frequently found in the absence of tenderness. Atrophic changes (appendicitis obliterans of Senn) are accompanied by increased tenderness in about 50 per cent of cases. Palpation over the region of the appendix in all gynecological patients is highly important, as experience has demonstrated that the appendix is diseased in a very large percentage of cases with extensive pelvic pathology.

Valuable information is obtained from vaginal inspection and palpation. Urethrocele is frequently not detected and the method of diagnosis is not generally known. Urethrocele is essentially a downward and not a backward displacement of the urethra. Urethrocele is detected by pressing the urethra upward toward the cervix, and the distance it can be so displaced represents the extent of the lesion, as it is normally quite fixed.

The position of the uterus can often be determined by the appearance of the cervix. When the anterior lip of the cervix is much thicker or longer than the posterior, the uterus is almost invariably in anterior position. The same rule applies to the posterior lip of the cervix.

Palpation of the uterosacral ligaments for tenderness is important as it often helps determine the degree of pathology of a retroposed uterus.

A most difficult class of gynecological patients to diagnose are those with pelvic pain without well defined pathology. Mistakes are commonly made in such cases, as the pain may be due to pathologic states that cannot be detected on pelvic examination, or the patient may have or complain of pain without the presence of pathology in the pelvic organs. It has been found that the pain from adhesions is chiefly due to traction upon the peritoneum. It is, therefore, easy to appreciate that any examination which will put such adhesions on tension will be attended by pain. This fact can be utilized in the diagnosis of such cases.

The low mortality of abdominal section tempts the surgeon to operate for pelvic symptoms without making a careful diagnosis, and for pelvic symptoms without demonstrable pathology. Surgery has developed beyond the time when the results of operations should be based upon mortality. The real test of modern efficient surgery is morbidity.

There is considerable danger of occasionally mistaking a large corpus luteum for a small ovarian cyst, and of thus subjecting the patient to an unnecessary operation. The corpus luteum at times attains a size two or three inches in diameter due to hæmorrhage or œdema about the gland. On conjoined palpation it is impossible to distinguish it from a small ovarian neoplasm. The diagnosis should be made by constantly keeping in mind the possibility of a large corpus luteum in the diagnosis of all small ovarian tumors and keeping them under observation a sufficient length of time to allow absorption in case of corpus luteum. A lapse of one month is probably long enough to establish a differential diagnosis.

EDWARD L. CORNELL.

**Bello, A.: Menstrual Fistula of the Abdomen** (Fistula menstrual del abdomen). *Rev. assoc. méd.*, Argent., 1916, xxiv, 242.

The case reported by the author occurred in a woman of 26 showing symptoms of tertiary syphilis. The uterus was anteflexed with both annexes enlarged and the uterus between them inflamed and painful and showing a prominence in the left iliac fossa without any modification of the skin. Exploration of the fossa disclosed nothing of importance. The wound did not close but established itself as a catamenial fistula through which there was an abundant flow of blood during the periods and a flow of pus in the intramenstrual epochs.

The fistula persisted in spite of all attempts at treatment, and laparotomy was done. The epiploon and intestinal loops were adherent to the left uterus and annex. The uterus was fibrous and twice the usual size and adherent to the bladder. The right annex was cystic. The tube of the left annex was largely cystic in the ampullar region. The first part of the tube led to a fistula which was located in the abdominal wall at the left of the median line.

A subtotal hysterectomy was done with ablation of both annexes. A portion of the epiploon was



resected and the fistulous tract closed by sutures. Recovery followed.

W. A. BRENNAN.

**Stevens, T. G.: Adenomyoma of the Rectovaginal Septum.** *Proc. Roy. Soc. Med.*, 1916, ix, *Obst. & Gynec. Sect.*, 1.

The author refers to cases described by Lockyer, Spencer, Leitch, Bland-Sutton, Gough and Stewart, and to his own case previously demonstrated in 1909.

During the preceding eighteen months he has had under his care five more cases. These are tabulated in detail and illustrated. In the fourth of these cases the anterior rectal wall had been so involved as to be drawn up in a double fold, without, however, invading the rectal mucosa. In this case there was also present a cyst of the vaginal wall, undoubtedly of Gartnerian origin.

Stevens notes that the symptoms varied. In one case they were menorrhagia and dysmenorrhœa; in two cases sterility was the only complaint; in the other three bleeding was the chief symptom, due in one case to fibroids in the body of the uterus, in another to chronic metritis, and in the last to some unexplained general condition associated with the menopause.

The growths are all situated in the loose connective tissue above the posterior vaginal fornix, bounded anteriorly by the back of the cervix, posteriorly by the rectum, above by the peritoneum. They present hard nodular masses fixed to the back of the cervix and movable with it. They are not tender to the touch and cause no pain. The rectal wall may be involved but the rectal mucosa never.

Microscopically these growths show precisely the same structure as a diffuse adenomyoma of the endometrium, but as a rule the gland tubules surrounded by endometrial stroma are few in number. The tubules are often dilated and cystic, not infrequently containing blood or blood pigment. The surrounding stroma is composed of cell elements exactly like the stroma of the endometrium. The fibromuscular part of the tumor is clearly a definite new-growth. Although there is no capsule, the arrangement of the fibromuscular tissue is such that the growth is quite sharply marked off from the uterine muscle coats. There is perhaps more fibrous and less muscle tissue in the growth than in the uterine wall. In none of the specimens was anything found to suggest an inflammatory lesion.

The author discusses the various theories regarding the origin of these tumors and holds as untenable his original view that they are derived from wolffian remnants. The possibility that they are derived from the muellerian ducts, at the place where the fused ducts join the solid mass of cells from which the vagina is developed, cannot be disproved.

CAREY CULBERTSON.

**Montanari, E.: The Pathogenesis and Treatment of Genital Prolapse** (*Sulla patogenesi e sulla cura del prolasso genitale*). *Clin. chir.*, 1916, xxiv, 223.

The author passes in review and criticises the various methods in vogue for the treatment of

genital prolapse. He does not believe that vaginal or abdominal hysterectomy can ever be considered an ideal method, but only a procedure of necessity, inasmuch as such operations produce a grave and irreparable mutilation; hence the method should not be used on a young woman with a normal uterus.

Treatments limited to the vagina, such as colporrhaphy and similar operations are insufficient and interfere with colitus while they do not obviate the anatomopathologic alterations which were the principal cause of the genital prolapse.

The author insists that genital prolapse is chiefly due to inequality between the resistance of the peritoneum and endo-abdominal pressure, such inequality being determined either by a congenital or an acquired weakening of the support and stability of the uterus, and especially of the soft framework forming the pelvic floor. As a surgical procedure the author considers the operation devised by Ruggi to be the most efficacious and rational for the treatment of total prolapse in women within the active period of sexual life.

The main points in Ruggi's operation are as follows:

A circular incision above the normal position of the fornices; two incisions perpendicular to this on the two sides of the anterior vaginal column, these incisions being turned off at the ends. Three flaps of mucosa are thus formed, the central from the anterior vaginal column, and two quadrilateral side pieces. The neck of the uterus is drawn out and isolated. The two lower thirds of the lateral walls of the uterus are sutured with catgut to the base of the broad ligaments.

2. Obliteration of the ureterovesical and uretero-rectal cavities; suturing the uterine fundus with fine catgut to the peritoneal sac which covers the posterior face of the bladder; replacing the uterus. Douglas's sac is sutured to the uterine fundus posteriorly; supravaginal amputation of the neck of the uterus.

Posteriorly the sectioned vaginal mucosa is sutured to the posterior half of the stump of the neck in such a manner that a perfect adaptation is made between the vaginal and uterine mucosæ.

In front the vaginal column previously isolated is deprived of its superficial mucosa and shortened at its free extremity so that there remains only a strip of solid submucous tissue which is sutured to the anterior edge of the sectioned neck. This submucous strip is then covered by the two quadrilateral flaps previously mentioned. The operation is completed by Lawson-Tait's colpoperineorrhaphy.

The advantages claimed for this operation are:

1. Consolidation of the musculo-aponeurotic ring, which includes within it the isthmus of the uterus, and high fixation of the uterus, in approximately its normal position.

2. Abolition of pathologic peritoneal formations constituted by the uterovesical and uterorectal sacs.

3. Reduction of the weight and volume of the uterus by amputation of the neck.

4. Narrowing of the lumen of the vaginal canal and of the vulvar orifice; cure of cystocele and retrocele; and consolidation of the perineal floor.

5. Preservation of the integrity of sexual function.

The author reports eight cases very successfully treated according to this method and in at least one case it was followed by normal pregnancy and parturition.

W. A. BRENNAN.

**Hussey, A. A.: Operating During the Puerperium for Cure of Old Lacerations of the Cervix and Perineum.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 1014.

The author reports 40 cases in which Stuart and himself had operated for cure of old lacerations of the cervix and perineum during the puerperium. He does not contend that this time of operating is more favorable than other times but thinks that for some of the poor patients in the maternity wards there may be some real gain by operating at this time, since so many of these patients will not return to the hospital even though they are more or less invalidated because of their lacerations.

In 29 of the cases operated upon the recent labor had been conducted under normal conditions in the delivery room. In two cases labor began outside the hospital and terminated in the receiving ward without preparation for delivery. One case was admitted with a transverse presentation with prolapse of the cord and arm after unsuccessful attempts at version by the family physician. Placenta prævia complicated two cases. In two cases labor was induced with a bougie. Labor was terminated twice with podalic version and twice by forceps.

The lesions found in these cases were: 31 old lacerations, 9 old and new lacerations of the perineum, 22 old lacerations, and 6 old and new lacerations of the cervix.

The cervical lacerations ranged from moderate single to deep multiple. The lacerations of the perineum were incomplete in 38 cases and complete in 2. One case was complicated by a cyst of Bartholin's gland and hæmorrhoids.

The time selected for operation was from one to fifteen days post-partum. Five cases were operated upon twenty-four hours after delivery, 22 cases forty-eight hours after delivery. In 9 cases, the operation was done between the third and seventh days, and in 4 cases between the seventh and fifteenth days post-partum. The post-operative course was entirely normal in 35 of 40 cases and 5 had a little temperature.

In 25 of 29 cases of trachelorrhaphy, the cervix is

recorded as healed. Partial union occurred in 3 cases and non-union in one.

Good union was secured in the perineum in 32 cases, and partial union in six cases; non-union is recorded in one case. The condition of the pelvic organs on discharge was normal in 34 cases, while retroversion of the uterus was noted in 6 cases.

The presence of lochia did not seem to have any unfavorable effect upon healing. The post-operative care did not differ from that of cases repaired after recent injuries.

C. H. DAVIS.

**Healy, W. P.: Sterility in the Female.** *Med. Rec.*, 1916, lxxxix, 954.

Sterility in the female may be due to pathological conditions grouped as follows: (1) malformations, (2) inflammations and infections, (3) injuries, and (4) tumors.

Relative sterility cases in the fourth group are due to fibroids of the uterus; or in the third group there may be miscarriages as a result of uterine displacements or traumatic lesions of the pelvic organs following previous pregnancies.

The gonococcus is chiefly responsible for sterility due to inflammations. Practically all cases of absolute sterility belong etiologically in the first and second groups. Lack of complete development of the uterus is the most frequent factor in the first group. On this the clinical findings fall into three groups: (1) small, poorly developed uterus with scanty menstruation, (2) small uterus with ante-flexion, a normal period, and dysmenorrhœa, (3) a normal sized uterus with long conical cervix, stenosis of the cervical canal, menorrhagia, and dysmenorrhœa. Any one of the above groups may be complicated by retroversion. Apparently normal organs in apparently healthy sterile women are found. These cases often have excessively acid vaginal secretion.

Apparently normal cases are benefited by saline douches at bed time and a restriction of intercourse. Groups 1 and 2 should have dilatation, curettage, and stem pessary. Group 3 can be helped by dilatation, curettage, and the Dudley operation on the cervix.

Retroversions should be corrected by pessaries or operation.

Sterility due to gonorrhœal infection is least satisfactory to treat. Those cases in which no palpable lesions of the adnexæ exist should have dilatation, curettage, and saline douches. Failing this an exploratory laparotomy should be done with proper care of any adhesions found.

Gonorrhœal cases with palpable lesions require curettage and plastic surgery on tubes.

W. F. HEWITT.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Costa, R.: Treatment of Extra-uterine Pregnancy in the Advanced Periods** (La terapia della gravidanza extrauterina nei periodi inoltrati). *Gazz. d. osp. e d. clin.*, Milano, 1916, lxxvii, 229.

The author believes that after the sixth month active intervention is necessary. If the foetus is dead operation can be delayed for about a week if the condition of the mother permits it. If the foetus is alive the termination of the pregnancy can be awaited.

Intervention can be made vaginally or abdominally. In the former the colpotomy incision must be sufficient to allow free passage of the head. Introduction of the hand or external maneuver are generally to be discountenanced and it is best to allow spontaneous placental elimination.

Abdominal extraction is indicated only when the conditions are unfavorable for vaginal extraction. Median incision is the rule but when the sac is developed in the large ligament the Pfannenstiel incision is resorted to. Difficulties in abdominal extraction are ascribable not to the foetus but to the treatment of the annexes. These may be left intact or they may be partially or totally removed. The latter is the ideal way. In leaving the appendages behind there should be partial or complete closure of the abdomen. Partial closure finds its indications in septic or suspected cases, when the sac and the placenta are firmly adherent or dangerously implanted on other organs, such as the liver, bile-ducts, etc., or when the placenta is very difficult to remove. In this case the technique is reduced to the opening of the abdomen and the sac, the extraction of the foetus, tamponing, marsupialization of the sac, and partial abdominal closure. Total removal of the ovarian tissues is the ideal procedure and the most correct surgical method.

W. A. BRENNAN.

**Arnold, J. O.: Some Practical Points in the Treatment of Eclampsia.** *Therap. Gaz.*, 1916, xl, 381.

Arnold believes that a judicious combination of the Stroganoff or "conservative" method with some of the best of the more radical measures is, in most cases, productive of more satisfactory results than an attempt to follow either school alone. The Stroganoff method in several of the large European maternity hospitals has reduced the mortality in eclampsia from 20 per cent or more to 8 per cent or less. It is, consequently, the duty of obstetricians to give serious consideration to such a method and, so far as possible, to adopt it in practice, for no other treatment has ever given half so low a death-rate.

Most American and English obstetricians, however, believe that the uterus should be emptied whenever one or more convulsions have occurred. Consequently the author feels that after the convulsions have been controlled by the Stroganoff method, it is logical to terminate pregnancy by whatever procedure will give the least shock to the patient.

Arnold's plan of treatment, is, in brief:

1. Chloroform, if necessary, in the smallest possible quantity that will enable one to give the first dose of morphine without disturbing the patient.

2. The first dose of morphine, at least half a grain, to be repeated in two hours, or as soon and as often as is necessary to control the convulsions.

3. Bleeding as early in the attack as possible to the extent of from 12 to 24 ounces, sufficient to effect lowering of the blood-pressure.

4. After cleansing the lower bowel, the administration by rectal seepage of a solution containing 1 or 2 drams of sodium bromide and 2 or 3 drams of sodium carbonate to a quart of normal saline as rapidly and constantly as it may be absorbed. In case of rectal intolerance, he advises a solution of 2 drams of bicarbonate of soda to the pint of normal saline by hypodermoclysis.

5. In cases before the eighth month, after two or three convulsions, induce labor. After the eighth month terminate pregnancy by the most appropriate method.

6. With the possible exception of water, no drugs or food are to be given by mouth until long after the convulsions have ceased.

The author reports 17 cases with a mortality of 5. He states that in every case in which treatment was carried out efficiently from the start the results were good. Some of the consultation cases seen late were moribund and could not have been saved by any method of treatment.

F. C. IRVING.

**Boyd, G. M.: The Indications for Cæsarean Section.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 650.

The author believes that the low maternal mortality from cæsarean section within recent years has led to an almost reckless broadening of the indications, until at the present time this operation is performed far too frequently. He considers pelvic deformity in which the true conjugate is less than 7.5 cm. and pelvic obstruction as the only definite indications. As long as the etiology of eclampsia is obscure, its treatment by means of cæsarean section is questionable. In rare cases he thinks it worthy of consideration but considers manual dilatation and rupture of the membranes, followed by

version or forceps, the better method of treatment for most cases. It is to be considered in some cases of placenta prævia and is the method of greatest safety for central placenta prævia. He questions certain so-called indications as face, brow, occiput posterior positions, pyelitis, and primary inertia. He urges that the test of labor should be given the patient in all cases in which the indications are only relative.

C. H. DAVIS.

**Costa, N. P. : Segmental Cæsarean Operation** (*Cesàrea segmentaria*). *Semaine méd.*, 1916, xxiii, 552.

Under this title are included those procedures which involve the lower segment in contradistinction to the classical cæsarean operation which always involves the uterine body. The group includes suprasymphyseal inguinal, cervical posterior sections and laparocolpohysterotomy.

The author refers to the various procedures since Jorg of Leipzig in 1807 and Osiander about the same time first exposed their technique. Ritgen put the extraperitoneal method into practice in 1821. Thomas, of New York, in 1870 revived the technique of Ritgen and the statistics published later by him and his followers showed a maternal and foetal mortality of 50 and 42.8 per cent, respectively, which was no higher than the mortality from the classic operations.

In more recent times the methods were multiplied and according to Holzapfel and Franck there were in 1907 no less than seventeen distinct procedures. The author summarizes each of these methods, which he states may be arranged in two great groups, the extraperitoneal and the transperitoneal. The first was founded on anatomic principles, the transperitoneal method arising as a necessity due more or less to the difficulties of technique which in the majority of cases sufficed to completely nullify the object of the intervention. Franck originally followed the extraperitoneal route, but owing to the difficulties encountered was the first to try the transperitoneal and published his first seven cases in 1904. His procedure was later modified by Sellheim, Latzko, and others.

Accidents are more numerous by the extraperitoneal route, owing to the anatomical difficulties and conditions arising which cannot be foreseen. The most common accident is peritoneal injury, and according to the statistics of Jeannin and Schauta the peritoneum was opened in about twenty per cent of the cases. Nouvian's statistics showed 13.3 per cent, but Latzko and Doderlein by their procedure reduced the figure to 11.2 and 7.2 per cent, respectively.

The next most frequent accident was vesical rupture which occurred in about 3 per cent of the cases. These and other lesser accidents are, however, reduced to a minimum by the transperitoneal method. Sometimes the uterine muscle is lacerated or torn. As a late accident, fixation of the uterus to the abdominal cicatrix has been observed, and this facilitates retroflexion. Such adherences, ac-

cording to Wiebel, are met with in 25 per cent of the cases but they rarely cause a premature delivery or a grave dystocia.

The principal indication for a segmental cæsarean operation is in a case where the classic operation is contra-indicated, i.e., a case with infection. This indication, however, has not borne the brunt of criticism because the transperitoneal procedure with its provisory sutures is not capable of hindering contamination of the peritoneal cavity, or preventing the evolution of a fatal peritonitis.

Sellheim from his studies considered that segmental cæsarean section was the only treatment in placenta prævia and in six cases so treated by him and one by Henkel there were no deaths.

The general opinion, however, appears to be that this procedure cannot compare with pure obstetrical procedures nor with the classical cæsarean section except in very special cases or in a case of complete dystocia. Any other conditions which contra-indicate the classic operation, are indications for the segmental, i.e., threatened rupture of the uterus or incomplete rupture of the lower segment, pulmonary tuberculosis, meningitis, pelvic tumors, etc.

The author believes that owing on the one hand to the great number of cases of subsequent rupture in the scar and the adherence of the uterus to the abdominal wall and organs in the classic cæsarean, and on the other hand to the absence of such complications and more especially the firmness of the segmental cicatrix, this intervention should be studied further and an endeavor made to give it broader indications. Concerning the maternal and foetal mortality and morbidity the author refers to Jeaninn's statistics, published in 1909, which gave 150 cases with a global mortality of 7.3 per cent. Eliminating eight deaths due to infection reduces the figure to 5.33 per cent. Latzko's statistics, omitting infective deaths, gave an operative mortality of 4.21 per cent; Nouvian's 3.6 per cent; Bumm's 2.85 per cent; Weibel's 3 per cent.

Jeaninn's statistics showed more or less grave post-operative complications in about 30 per cent of cases, Nouvian's 24 per cent. Foetal mortality varies according to the different statistics from 1.15 to 3.62 per cent, omitting deaths prior to intervention. Asphyxiated births compare favorably with the classical operation.

According to the statistics the segmentary cæsarean operation has an advantage of more than 2 per cent over the classical operation. Among the principal objections to the classical operation, as pointed out by Sellheim, are hæmorrhage; intestinal lesions; facility of infection of abdominal cavity by the introduction of amniotic fluid and blood; epiploic adherences; danger of cicatricial rupture in later labors; frequency of abdominal hernia, etc.

Schauta has pointed out that most of these are merely the result of faulty technique and thinks that segmental cæsarean section lacks the advantages claimed for it and that the probability of infection is greater. Although opinions are divided the



author concludes that dominant opinion at present is: for uncomplicated cases, the classical operation; for suspicious cases, the segmentary; and for manifestly infective cases, a Porro or uteroparietal fistula operation.

W. A. BRENNAN.

**Beach, R. M.: The Management of Ovarian Tumors Complicating Pregnancy, Labor, and the Puerperium.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 1029.

From the frequency of ovarian tumors and their infrequency as a complication of pregnancy the author reasons that these tumors do actually prevent conception. A thorough routine examination of all antepartum cases as early in pregnancy as possible will do much to eliminate the dangers of the situation. Beach finds that the main complications, torsion, rupture, and suppuration, occur in 25 to 30 per cent of the cases associated with the pregnant or puerperal state.

The author believes that ovarian tumors discovered during the first half of pregnancy should be removed by ovariectomy before the second half of pregnancy. If the tumor is discovered during the second half of pregnancy it should be removed if of considerable size, since the excessive distention of the abdomen might tend to interrupt pregnancy. A waiting policy should, however, be chosen for other cases, such as dermoids, broad ligament tumors, pelvic bound tumors, and bilateral tumors in the childless woman.

Non-obstructing tumors discovered during labor should not be operated upon if labor is progressing well. Obstetric manipulations should be limited and labor made as easy as possible.

Obstructive tumors seen during labor are considered under three headings: (1) Clean cases seen early in labor may be treated by posture and reposition, cesarean section plus ovariectomy or waiting until full dilatation of the cervix, which is dangerous owing to the possibility of rupturing the cyst. (2) Clean cases at the end of the first stage should be operated upon as that method gives the best insight into the condition present. (3) Infected cases seen late in labor must be operated upon at once. Cases that pass through labor should be operated upon during the puerperium.

C. H. DAVIS.

**Danforth, W. C.: Pyelitis of Pregnancy with Especial Relation to Its Etiology.** *Surg., Gynec. & Obst.*, 1916, xxii, 723.

The author made simple cultures on blood serum of the urine of 50 pregnant women. In only five of these were colon bacilli found. The remainder showed a growth of staphylococcus. A further series of 14 was much more carefully studied, the urines being cultured in agar plates to which human ascites fluid had been added, in agar shake cultures, and in anaerobic tubes of agar to which had been added human ascites fluid and goats' blood. None of this series showed colon bacilli. One showed a

pseudodiphtheria bacillus, one an unrecognized spore-forming bacillus. With the exception of a few which were entirely sterile the remainder showed staphylococcus.

An observation is included upon a case in which the ureters were catheterized to relieve distention of the right kidney pelvis. The catheter would not pass up the right ureter although it passed up the left one readily. Upon placing the patient upon the left side to permit the uterus to gravitate away from the ureter the catheter passed up the ureter very readily and urine flowed rapidly from the catheter. It is assumed, therefore, that obstruction of a mechanical character can be caused by the uterus. As colon bacilli were so infrequently found the author assumes that the infection is, in the majority of cases, a blood borne one.

As to treatment, in addition to postural methods the use of the ureteral catheter is urged previous to deciding upon emptying the uterus. The author believes that a considerable number of cases may be relieved by this means. Nephrotomy and nephrectomy are discussed.

**Norris, C. C.: Pregnancy in the Tuberculous.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 997.

The study of this subject has led the author to believe that, as a general rule, pregnancy, and especially the puerperium, exerts an unfavorable influence upon the course of tuberculosis. Whether the normal pregnant woman is more susceptible to infection by the tubercle bacilli is still an open question. It is certain that a definite proportion of women apparently contract the disease either during pregnancy or the puerperium. This is particularly true of the wives of tuberculous men living amid unhygienic surroundings.

The combined results of fourteen observers show that the average infant mortality in a large series of cases was 58.83 per cent. Armand-Delille studied a series of 787 children born or living in 175 families, one or more members of which were tuberculous. Of these children, 323 were placed in the country and did well; 396 were not removed from their infectious surroundings, and of these 238 developed tuberculosis.

Apart from the exacerbation of the pulmonary condition which occurs so often during pregnancy, it seems that these patients are more subject to the various obstetrical complications than normal individuals.

Albeck of Norway treated 16 patients in a private sanitarium, yet 6 died within fifteen months. Essen-Moeller reports that death or aggravation occurred in 50 per cent of his patients treated in private sanitariums. Ebeler, from a study of 32 cases, advises the immediate emptying of the uterus in any month of pregnancy. Parry reports that in a series of 38 cases, all of the severe type, 50 per cent died within two months after labor. Bacon estimates that 33 per cent of tuberculous women die in less than one year after labor.

Practically all authorities recognize the gravity of laryngeal tuberculosis. Fellner in a series of 289 cases had a maternal mortality of 44 per cent. Lobenstein collected 231 cases of laryngeal tuberculosis from the literature, 200, or 86 per cent, of whom died during pregnancy, labor, or soon after, and Raspine emphasizes the ill effects of this condition. The death-rate among the infants of these patients was about 60 per cent. Imhofer reports a foetal mortality of from 86 to 90 per cent when the mother has a laryngeal involvement; Kuettner 90 per cent; and several others give similar figures.

Tuberculous women should not nurse their children, except in exceptional circumstances, for the mother's sake, and because of the dangers to the child.

Unfortunately, despite the most painstaking studies, it cannot be determined with certainty which women will bear pregnancy and the puerperium well, and which will fare badly. The safest plan for the tuberculous woman is to avoid conception. In those exceptional cases in which conception has been countenanced, strict hygienic measures must be enforced and the woman kept under close observation and examined at frequent intervals by the experienced internist.

In the early months of pregnancy, with a rapidly advancing pulmonary lesion, there can be no question but that the induction of abortion should be performed without loss of time, and this is also true if laryngeal involvement occurs. On the other hand, given a similar case in the late months of pregnancy, little can be gained by the induction of premature labor. The author believes that in the presence of an extensive lesion, even in the quiescent period, or even of a small active lesion, or any laryngeal lesion the uterus should be emptied at once. The longer a lesion has been inactive the better the prognosis, as a general rule.

The combined statistics of 21 observers, comprising nearly 1,000 cases of intervention within the first four months, indicate that 77 per cent of the women were benefited by emptying the uterus, the percentage varying from 20 to 97 per cent. The author believes that the wise obstetrician will familiarize himself with the results obtained by others, and that he will individualize his cases, and empty the uterus only when it is necessary, but that he will not allow his natural repugnance to the performance of this operation to influence him to the detriment of his patient, if after consultation it seems advisable.

C. H. DAVIS.

**Vantrín: The False Appendicitis of Pregnancy**  
(Les fausses appendicites de la grossesse). *Ann. de gynéc. et d'obst.*, 1916, xlii, 177.

The author reports five cases in which there was a diagnosis of appendicitis, all the clinical signs apparently being precise and conclusive, but which proved wrong on intervention.

In the first case a gangrenous diverticulum showing all the symptoms of appendicitis called for urgent

operation. The appendix was found absolutely normal. In two other cases the trouble was found to be due to a suppurated dermoid ovarian cyst. The fourth case was very interesting. It presented all the classical signs of sudden pains in the right lower abdomen, particularly located over McBurney's point. Intervention, however, showed the cæcum and appendix to be healthy with a hæmatic collection above them which extended into the iliac fossa as far as the uterine cornua behind and the broad ligament below. A disrupted ampullar pregnancy on the right tube was found coincident with a normal uterine pregnancy which continued to term.

The fifth was a post-partum case which was found to be due to the twisted pedicle of a partially suppurated ovarian cyst, the symptoms of which simulated appendicitis.

W. A. BRENNAN.

### LABOR AND ITS COMPLICATIONS

**Grad, H.: Foetal Dystocia and Cæsarean Section.**  
*Med. Rec.*, 1916, lxxxix, 1137.

The author reviews the various forms of treatment of foetal dystocia with a plea for the more frequent performance of cæsarean section for this complication of labor.

The various forms of foetal dystocia are classified as follows:

1. Foetal dystocia from faulty attitude: (1) excessive flexion of the head, Roderer's obliquity; (2) Bregma presentation, incomplete flexion; (3) brow presentation; (4) face presentation; (5) presentation of anterior parietal bone or ear, Naegele's obliquity; (6) presentation of posterior parietal bone or ear, Litzmann's obliquity.
2. Foetal dystocia from faulty presentation: (1) pelvic presentation; (2) shoulder presentation.
3. Foetal dystocia from faulty position: (1) persistent occipitoposterior position; (2) persistent mentoposterior position.
4. Foetal dystocia from general foetal conditions: (1) multiple or compound presentation; (2) multiple birth; (3) malformation; (4) deformities; (5) anomalies.
5. Oversize of foetus.
6. Oversize of head.
7. Premature ossification of head.
8. Congenital hydrocephalus.

In many cases of delayed labor due to foetal dystocia haste is unnecessary; a quick and immature conclusion should be avoided. The history of the case must be fully considered whether the labor is at term or over due; the duration and progress of labor; the nature of the uterine contractions, especially as to the efficiency; the general condition of the mother; the condition of the amniotic sac; the condition of the foetus, and of the uterus; and the condition of the rectum and bladder. Full information as to the above points will serve to assist in determining the proper procedure to follow. Having obtained a full history of the case a careful examination of the mother and foetus should be made.



Under full anæsthesia the whole hand if necessary should be passed into the vagina and an effort made to correct any faulty attitude or position, and if possible, to engage the head in the pelvis. By allowing labor to continue many faults will be spontaneously corrected by the forces of nature, or rendered amenable to an easy forceps delivery.

Under operative treatment, the author disregards embryotomy upon the living child; pubiotomy is not considered.

The high forceps operation is regarded as a dangerous procedure for both mother and baby and justifiable only under exceptional circumstances. The high foetal mortality and considerable maternal morbidity of version should cause it to be regarded as a formidable procedure.

For clean cases cesarean section is the ideal mode of delivery, yet its dangers, shock, hæmorrhage, and sepsis must be weighed against the dangers and limitations of the alternative operations.

PHILIP F. WILLIAMS.

**Telfair, J. H.: Rupture of the Uterus During Labor.**

*Am. J. Obst.*, N. Y., 1916, lxxiii, 655.

The author gives a brief discussion of this subject, reviewing some of the recent literature and showing that one of the more common causes working to increase this condition at the present time is the reckless use of pituitrin in the general practice of obstetrics. He reports two cases of rupture of the uterus during labor, the first occurring during the process of what was apparently a normal labor in a slight, poorly-nourished woman, and the second probably caused by using rather large doses of pituitrin in a case having a generally contracted pelvis. Following the rupture both cases were operated upon, one dying seven hours after operation and the other on the fourth day from peritonitis.

In the discussion of this paper a number of cases which have not been recorded in the literature on this subject were reported.

C. H. DAVIS.

**Nicholson, W. R.: Anæsthesia in Labor.** *Therap.*

*Gaz.*, 1916, xl, 388.

Nicholson estimates that about 15 per cent of normal women in normal labor really need anæsthesia, not merely to accomplish delivery successfully, but to do so without evil after-effects. The remaining 85 per cent could probably be delivered as satisfactorily without anæsthesia as with it. With this in mind, it behooves the obstetrician to select an anæsthetic for use in labor which is not only efficacious but also safe for mother and child.

Chloroform is an efficacious anæsthetic and easy to administer but its danger is great enough to preclude its use. Its margin of safety is narrow and its secondary results are frequently serious.

Ether is the safest of anæsthetic agents. Its use as an analgesic has been quite satisfactory. It is cheap and easily administered.

The experience of those in this country having had a considerable experience with the scopolamine-

morphine-narcophin-pantopon method varies from practically complete success to marked failure. At best it should only be used as an adjuvant to the first stage. As a means of procuring a painless delivery it is non-efficient and dangerous, the danger being due to the impossibility of individualizing the patients, together with the uncertainty of the action of the drugs and also their relatively slow elimination.

Nitrous oxide and oxygen, after one has had some experience in the use of the apparatus, will be found 100 per cent efficient instead of failing in from 10 to 40 per cent of cases, as does scopolamine. In the hands of a capable anæsthetist, nitrous oxide and oxygen is no more dangerous than ether. Its administration, especially to the deeper surgical degree, should not be attempted by one unskilled in its use. With this anæsthetic there is no increased tendency to asphyxia neonatorum, nor is labor prolonged, nor is post-partum bleeding increased over the normal.

F. C. IRVING.

**Ferreira, F.: Obstetrical Analgesia by Epidural Injections of Novocaine** (La analgesia obstétrica por inyecciones epidurales de novocaina). *Cron. méd.*, 1916, xxxiii, 137.

Ferreira reports the details of five cases in which he made injections of novocaine solution combined with sodium bicarbonate and sodium chloride, according to the method of Lowen, as an obstetrical analgesic. The injections were made in the ligamentous membrane of the sacral region, and gave favorable results.

W. A. BRENNAN.

**Iraeta, D.: Analgesics in Parturition** (Los analgésicos en el parto). *Tesis*, Buenos Aires, 1916.

Morphine as well as other analgesics, derivatives of opium, given during labor, may produce slight symptoms of intoxication, but may cause the death of the foetus. As to the sensational discovery of Paulin of Paris, that in obstetrics morphine can be separated from its toxic substances, without influencing its analgesic properties, the author accepts it with the suspicion of the existence of an oxytocic in the product injected, basing the suspicion upon the presence before the period of analgesia, of a short period of hyperæsthesia and a concomitant increase in the intensity of the uterine contractions.

The author in collaboration with Houssay and Beruti had succeeded in detoxicating morphine by the use of ferments. This product newly obtained was injected in different animals, and it was demonstrated that the new product was of greater toxicity than morphine itself. Injecting in a series of parturient women a solution of ferments, it was found that it had an oxytocic action more ephemeral than that of the hypophysis.

Clinical experimentation showed that major doses of 0.02 cg. of morphine caused an increase in the intensity of the contractions immediately after the injection, and that the pain decreased much sooner.

The author has devised an apparatus, inexpensive and easily manipulated, to register uterine contractions and to combine direct observation with external hysterography.

Internal hysterography must be abandoned, in his opinion, for the following reasons:

1. The balloon is difficult to place if there exists no relative dilatation of the cervix, and more difficult to place when the head has passed the superior strait.

2. During the expulsion period, the balloon is pushed out with the progress of the foetus.

3. The entire apparatus introduced into the uterine cavity is an excitor of the contractility of the organ and modifies its rhythm and intensity.

4. If the bag of waters is intact, the balloon pushed in may break it and give rise to a dystocia.

5. It is difficult to avoid displacing the balloon when it is in the uterus.

6. It is dangerous to the mother as well as to the foetus to introduce an apparatus into the uterus.

The difficulties encountered have resulted in the abandoning of this method.

The apparatus consists of the brassart of Pachon, a moderator, and a Marey's drum.

The brassart inflated and held by means of leather straps, is applied to the abdominal wall in the region of the fundus of the uterus at a point where it is not influenced much by the respiratory movements.

The rubber tube that starts from the brassart, is placed in communication with a small Barnes bag, placed in an ordinary milk bottle, whose other tube opening is united by another rubber tube to Marey's drum. The author also uses an apparatus consisting of a drum, one face of which, flexible and provided with a spring, is put in contact with the abdominal wall by means of a spring; the other, rigid, holds a tube which communicates with a Marey's drum.

The registering cylinder used is one of the Baltzar type, of a voluntary, regular movement. As the registrations indicate the time of the beginning and termination, one can easily calculate in any segment of the graphic, the duration, the intensity, and the frequency of the contractions.

The objections which could be raised against this procedure may be due to the operator and the selection of the case. In the author's experience the apparatus gave only indications relative and comparable, in the same subject and at the same session.

The high and low altitude of the register depends upon the degree of compression of the apparatus on the abdominal wall, and it is very difficult to find it the same in different subjects.

The height of the tracing which corresponds to the intensity of contraction, is not represented on the graphic, because the air pressure in the drums increases with the progress of contraction, and, therefore, during the last half of the contraction the resistance opposed would be much greater than at the beginning, consequently the height of the tracing will be lower than for the first half.

A question which arises is: Are the traces on the registering cylinder, or graphic, the signs of uterine contractions only, or are they the traces of contractions of the abdominal muscles also? The author states that the contraction of the abdominal muscles during the period of dilatation is a factor that disturbs the register very little, because the corresponding muscles remain passive during the period of labor.

In an illustrative case a woman was chloroformed, and the apparatus applied; the registrations of the contractions were equal before and during the anæsthesia.

The author's experiments upon women and animals, led him to the following conclusions:

1. Morphine maintains its toxicity when mixed with hypophyseal solutions.

2. Internal hysterography must be discarded, for it is dangerous to both mother and foetus.

3. In the study of uterine dynamics use should be made of external hysterography which is harmless.

4. A dose of morphine 0.0005 gr. per gram of animal weight is fatal to guinea pigs.

5. Morphine is not detoxicated by hypophyseal solutions.

6. The leaven of grain or beer, not only fails to detoxicate morphine, but seems to increase its toxic effects in animals.

7. The physiologic action of antalgésin and parto-analgia, according to the arterial pressure and the uterus, is equal to that of morphine.

8. The combination of large doses of morphine to small doses of hypophysis annihilates the oxytocic action of the last named.

9. Solutions of leaven have less oxytocic action than those of the hypophysis.

10. The generalized opinion that pain and pregnancy are factors opposed to morphine intoxication is of no value.

11. Morphine injected in a pregnant woman may be transferred to the foetal circulation without changes.

12. The sensibility to the toxic action of morphine is greater in children.

13. The personal susceptibility to morphine varies greatly in different individuals.

14. In some parturients the initial dose of morphine does not relieve the pain instantly, but it soon relieves the succeeding ones.

15. In 49 per cent of cases there is no indication for the administration of large doses of morphine for the relief of labor pains.

16. Products having morphine for a base, intended to produce analgesia in parturition are of inconstant action.

17. The injection of these products during the period of expulsion has little effect; their administration in obstetrical cases is not only unnecessary but injurious.

18. Opium derivatives do not relieve labor pains without changing the uterine dynamic, diminishing the number and intensity of the contractions.



19. Parturient women subjected to such analgesics suffer more or less from symptoms of morphine intoxication.

20. Compounds with morphine as a base may intoxicate a parturient woman without decreasing labor pains.

21. Generally speaking, the periods of dilatation and expulsion are prolonged in analgesized parturients.

22. The duration of labor is approximately nineteen hours for multiparæ, and twenty-four hours for primiparæ.

23. Artificial rupture of the membranes must very frequently be performed in analgesized women.

24. Analgesics increase the necessity for obstetrical intervention.

25. Opium derivatives, used as analgesics in parturition, intoxicate the fœtus in about 38.5 per cent of cases.

26. The administration of morphine compounds to a parturient woman may cause the death of the fœtus.

27. Chloroform by the drop method may be used as a harmless analgesic, and should be used in preference to all other anodynes.

28. The administration of chloroform in surgical doses produces serious disorders in the uterine dynamics.

RAOUL L. VIOIRAN.

**Olivella, R., and Arteaga, I. F.: Parto-Analgesia** (La partonalgia). *Rev. méd. de Sevilla*, 1916, lxvi, 199.

In 7 reported cases the author has used the preparation recommended and used by Cantón of Buenos Aires as a parto-analgesic. This preparation is composed of:

Chlorhydrate of morphine..... 4 centigrams

Hypophysis extract (fresh gland).10 centigrams

Sterile vehicle..... 1 cubic centimeter

The author found that in all cases pain was diminished notably, and in fact was not appreciable except at the passage of the head; that the contractions persist; that the parto-analgesic produces marked somnolence; that the digestive, circulatory, respiratory, and urinary apparatus were not affected; that post-partum vomiting occurred in only one case; that involution was normal; that the child in only one case was born apnoëic, and in this case recourse was had to artificial respiration; that the infants during the first twenty-four hours were stupefied and dull and required watching.

W. A. BRENNAN.

## PUERPERIUM AND ITS COMPLICATIONS

**DeLee, J. B.: Puerperal Infection.** *Chicago M. Recorder*, 1916, xxxviii, 314.

The statistics of 1914 show that 3,500 women died in the United States from puerperal infection; that is, 10 women per day died in the United States from puerperal infection during that year. This is the reported number from the 66 per cent of the reg-

istered population of the United States, which means that the deaths are reported and are received at the Census Bureau at Washington. In addition to those dying from puerperal infection, there are a large number of women who die under an entirely different diagnosis.

It is generally considered that puerperal infection is due to an infection of the parturient canal by germs, and probably that is true. It is believed that the streptococcus causes most of these infections. Probably that is true, too, but other germs likewise cause puerperal infection, such as the staphylococcus (three kinds), the gas bacillus in rare cases, and, in rare instances, the diphtheria bacillus. How these infections get in, however, and why one woman is infected by a bacterium that leaves another woman intact, we do not know.

One factor that has a great deal to do with the incidence of infection is the epidemic influence. At certain seasons of the year the bacteria that are ordinarily present in the room and in the dust and air acquire the highest degree of virulence.

The conduct of labor has as much to do with the prevention of infection as the asepsis of labor. To put it in a nutshell: the asepsis of the labor, the sterilization of gloves and hands and all implements, the headpiece, the mouthpiece that go with the proper aseptic conduct of labor are not all there is to be done in the prevention of puerperal infection. To this must be added the proper conduct of labor.

Classifying all cases of puerperal infection at the start, because that is the time when local treatment, if it does any good at all, should be instituted, we can make the sweeping declaration that the local treatment of puerperal infection has seen its day. There is still a rather marked difference on one point regarding local treatment. There are those who believe that if the physician is convinced there is decomposing material, particularly placental, in the uterus, it should be removed at once. If a woman has an undoubted puerperal infection and has a piece of placenta in the uterus, the greatest danger she runs is the danger of hæmorrhage, and it has been the author's practice wherever hæmorrhage did not exist to leave the piece of placenta in the uterus until the protective barrier which Nature throws up against the advancement of the infection has been thoroughly established and enables the uterus to be invaded without the danger of spreading the infection. However, if hæmorrhage interferes with this expectant treatment, something has to be done and there is the choice of two remedies: one, tamponing the uterus and stopping hæmorrhage that way, hoping when the tampon is removed that the piece of placenta will come with it, and the other is immediate manual, digital, rarely instrumental, removal of the piece of placenta. That such a course of treatment is successful and is not dangerous has been proven time and again and has been proven by the respectable minority of men who believe in that form of treatment. The protective wall of granulation should not be disturbed.



If a piece of placenta in the uterus is infected and is causing puerperal infection, by the time the woman has had the first chill the bacteria are far beyond the uterine wall. They have gone into the blood, into the connective tissue, if they are going at all.

If a woman has a hæmolytic streptococcus in the uterus, whatever is done to the uterus helps very little because the infection has gone beyond the reach of anything that can be done locally. If she has not a streptococcus hæmolyticus infection, it makes little difference what is done, because the infection is superficial and in the course of time will be cast off by itself; but one should avoid doing anything which would convert a non-virulent invasive organism into a virulent and invasive one. The question is asked: "Would not a piece of placenta decomposing in the uterus in itself conduce to the development of invasive qualities of a hitherto non-invasive and harmless organism." This question? has been answered "Yes" and "No." It has been said that the streptococcus living as a parasite is harmless in the genital tract, but given enough placental tissue and blood to feed on, it will develop invasive qualities, and by removing the pabulum the streptococcus will not develop these qualities. This has not been proven by experience. It has been shown time and again that if a wound that is granulating nicely, in which Nature is throwing off infection in a successful way, is opened and the granulations broken down, a veritable inoculation of the woman with bacteria is produced.

The other methods of treatment, vaginal douches, while not very harmful, are not entirely harmless; they do no good and had better not be given. Brushing the uterus with tincture of iodine the author discontinued long ago; but one form of local treatment he still insists on and that is the removal of perineal and cervical stitches. He believes in providing free drainage. If there is plenty of room for the secretions to get out, then there is a greater chance of overcoming the infection. Outside of the removal of the stitches the author uses no local treatment.

In the general treatment, he still uses antistreptococcus serum. If a patient comes down with a chill, high temperature, prostration, and presents the symptoms of streptococcal infection, he gives 200 ccm. of the serum. If she does not make a marked improvement, he discontinues the treatment. The author has not seen any complications aside from pains in the joints and urticarial eruptions.

DeLee uses very few vaccines because he has seen no benefit from them. Neither has he seen much, if any, beneficial effect from collargol and electrargol. Normal salt solution is a good adjuvant, but he has not had the wonderful results from it that his colleagues report.

The author's advice is: "Do not be in a hurry to open a pelvic abscess. Of course, that does not mean you will sit by and let it break into the bowel or the general peritoneal cavity, or break out on the skin. Do not be in a hurry to take out a pus tube

after puerperal infection." He has never taken out the uterus for puerperal infection, and he notes that there is great conservatism manifested in the operation of removal of the uterus.

In the prevention of puerperal infection, he lays particular stress on the method of conducting labors in the hospital; also the chances of infection being spread after sterile supplies are exposed to the air.

EDWARD L. CORNELL.

**Hedblom, C. A.: A Case of Phlebitis Migrans. *J. Am. M. Ass.*, 1916, lxi, 1777.**

A married woman of 26 was in her fourth pregnancy in five years. The first two babies had died of marasmus; the third was living and well.

The labor progressed without incident and a 7.25 pound baby was born at the end of the twelfth hour by normal mechanism. No laceration of the perineum occurred. The placenta came away after ten contractions. The uterus was atonic and in spite of ergot and massage there was rather more than the average amount of bleeding, but the pulse did not go above 90.

The temperature remained between 99 and 100.2° for the first ten days of an otherwise uneventful convalescence. On the eleventh day the patient had a drenching night sweat and there was a sharp rise of temperature to 104°, pulse 110. The breasts were normal, the fundus well down and not tender. The white count was 17,000, hæmoglobin 60 per cent. There was marked tenderness and some induration over the course of the right saphenous vein, and the leg soon became swollen and œdematous. Treatment consisted in elevation, use of the ice bath, absolute rest, etc. After three days there was a marked drop in temperature and pulse, and, although the tenderness and swelling extended progressively down to the foot, there was a gradual but steady improvement until the beginning of the fourth week. At this time the temperature again rose sharply to 104.5°, pulse 135, and marked tenderness, induration, and swelling developed in the right thigh. The patient was nauseated a great deal during the next two weeks, vomited at intervals, and complained of pain in the epigastrium much aggravated by food. The pulse remained at about 130, became weak and irregular, and there was increasing prostration in spite of the fact that the swelling and tenderness in the legs all but disappeared.

During the sixth week of illness these symptoms recurred first in the left and then in the right leg, with pain in both legs and feet, which became so severe as to prevent sleep, except after morphine. There followed, however, a period of general improvement, during which the patient was again able to take food, and for several days the pulse and temperature remained at about normal. During the eighth week induration, tenderness, and swelling appeared progressively over the left side of the neck, axilla, arm, and left chest. There was also increased swelling in the left flank and lower abdom-



inal wall, which was spastic and very tender to palpation. The swelling in both legs increased and pain in the legs and feet became so severe as again to require the administration of morphine. The temperature was from 102 to 103°, the pulse from 130 to 140 and at times almost impalpable. During this recrudescence, which lasted about two weeks, gangrene developed over the anterior aspect of both feet, which resulted finally in the separation of the whole thickness of the skin and partial sloughing of the tendon-sheaths.

After another interval of improvement, there was a fourth relapse, during which the right side of the neck, the right axilla and arm became involved, and then successively the occiput, whole scalp, and face. During the height of this attack, sharp pain developed in the chest, aggravated by deep respiration, but no friction rub or other signs were elicited. There were nausea and vomiting lasting several days. The voice became husky and the patient complained of severe headache and pain in all affected parts, but most marked in the feet. The symptoms abated toward the end of the tenth week for a period of about twelve days. This was followed by the sixth and last relapse, characterized by abrupt rise of temperature from normal to 102°; the pulse was accelerated from 120 to 140 and again became irregular and at times almost impalpable. At the beginning of this attack there was a good deal of vomiting and violent headaches. The swelling in the neck and scalp, which had begun to subside, also increased. After four days the patient became very drowsy, suffered lapses in memory, and finally became partially irrational for several days. Ophthalmoscopic examination: papillitis of both optic nerves; outline of both disks entirely lost; vision almost normal, but with duplication of objects.

The patient was discharged in the nineteenth week in good general condition. Nine months after the onset of the illness there was no swelling or disability, the patient was in excellent health and of maximum weight, and was able to play golf and tennis. She was admitted two months after this time and an appendectomy done for subacute appendicitis.

EDWARD L. CORNELL.

#### MISCELLANEOUS

**Commiskey, L. J. J.: Routine Wassermann Reaction in Hospital Obstetrics.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 676.

This report is based on the routine Wassermann tests in 1,822 mothers and 1,074 newborn infants, the larger number of mothers being due to the fact that the women were subjected to the test eleven months earlier than the infants as a routine and also that some mothers left the institution undelivered. Of the mothers tested 145, or 8 per cent, were

positive; 26, or 1.4 per cent, were doubtful; and 11 negatives, or 0.6 per cent, had infants whose reactions were positive or doubtful. Only 26, or 18 per cent, of these women with positive reports gave any history or showed any signs of syphilis, leaving 119, or 82 per cent, with positive reports, who showed neither clinical evidence nor gave a history of the disease. From this it can be seen that many cases would have escaped diagnosis but for the routine Wassermann reaction. The conclusions are as follows:

1. The routine Wassermann reaction is the ideal method for the detection of syphilis in the pregnant woman, or as near the ideal as our present knowledge will permit.

2. From this comparatively small number of cases it would seem that syphilis has but a slight influence on the length of gestation, but does seem to produce a much higher percentage of stillborn infants.

3. That the use of the blood or serum from the umbilical cord, for the treatment of others, is unwise and dangerous, without the Wassermann being done upon both the foetal and maternal bloods.

4. That the death-rate among children of Wassermann positive mothers is four times greater during the first ten days of life than in the case of children where both mother and child are negative.

C. H. DAVIS.

**Iyer, H. N.: A Case of Siamese Twins.** *Indian M. Gaz.*, 1916, li, 237.

The author reports a case of a woman, aged 26, VI-para, who had been in labor for three days. Upon his arrival he found a foetal head and left forearm delivered. These had been exposed for six hours. On vaginal examination a second head, with its face turned toward that of the delivered one, was found. Attempts to push this head into the uterus failed. With some difficulty forceps were applied to the undelivered head with gratifying results. A common placenta was delivered shortly.

The twins were found to be attached by the rib cartilage. They were lying on their sides facing each other and the left hand of one was between the heads. The heads were distinct and all facial organs well formed. There were four hands, four legs, two separate vertebral columns, and a common abdomen covered only by peritoneum. There were two separate pelvic bones and male organs. A single cord passed under the peritoneal covering of the abdomen. The small and large intestines were found occupying both portions of the abdominal cavity. There was a single liver and spleen. There were two pairs of kidneys, a single heart, two lungs, and a common diaphragm. A case of "Siamese twins"—both stillbirths.

EDWARD L. CORNELL.

## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**DeVila, S.: A Case of Malignant Tumor of the Right Kidney in a Child of Four Years** (Sopra un caso di tumore maligno del rene destro in un bambino di 4 anni). *Riv. di clin. pediat.*, 1916, xiv, 169.

Malignant tumors of the kidney while not frequent are fairly familiar in pediatric literature. During the past 22 years in the pediatric clinic of the University of Rome, 14 such cases have been observed.

The first impression given by the case reported by DeVila in a girl of 4 years was that of an echinococcus cyst of the liver. The differential signs, however, ruled this out as well as other possible tumors, and the ultimate diagnosis of tumor of the right kidney was arrived at and intervention decided upon.

Under chloroform an incision was made in the cæcal region and the cæcal peritoneum opened up. On clearing away the pericæcal tissues and adhesions the tumor was found. The adhesions were between the anterior face of the tumor, the abdominal walls, and the colon. Luxating the tumor through the wound it was found to be attached to the right kidney by a pedicle. With its appendages the tumor weighed nearly 800 grams.

Histological examination showed that the tumor consisted wholly of sarcomatous, partly myxomatous neoform tissue, except at its inferior pole, where there was a zone of integral renal substance. In the lower pole was also found a urinary cyst and some small hæmorrhagic cysts. The tumor was composed mainly of fibrous fascia and young fibroblasts. This is the usual finding in histologic examination of malignant tumors of the kidney in children.

The subsequent operative history of the child shows that except for a bronchopneumonia there were no complications and five months later there was no evidence of recurrence.

The author gives a summary of the previous cases which are recorded in the clinic. The general mortality of non-operated cases is 100 per cent. In the operated cases the operative deaths averaged 40 per cent; deaths by recurrence after operation, 45 per cent; definite recoveries, 7 per cent.

W. A. BRENNAN.

**Fraser, A.: The Origin of Hypernephroma of the Kidney.** *Surg. Gynec. & Obst.*, 1916, xxii, 645.

Of 34 so-called hypernephromata studied by the author one was almost undoubtedly a neoplasm originating in an accessory nest of cortical adrenal cells, and

the patient, who was a woman, aged 28, was 6 feet in height, of excellently developed musculature, the hair on the head, the chest, arms, and legs was thick, coarse and abundant and there was a distinct moustache. The mammae were undeveloped and the chest was of the male type.

In 32 of Fraser's cases of so-called hypernephromata the morphological evidence indicated that the tumors were derived from the tubules of renal adenomata and had no histogenetic connection with the adrenal cortex. For this reason he suggests that the term hypernephroma be used only to include tumors which are undoubtedly of cortical adrenal origin, and that the term neophromata be applied to that large group of renal tumors to which the designation of hypernephroma is now given. In support of this contention he points out that the primary structure of adrenal tumors is essentially different from that of tumors of renal origin, that the primary structure of adrenal tumors never imitates that of renal tumors, but that the primary structure of certain renal adenomata can, at an early stage, through proliferation, imitate the primary structure or tumors of renal origin. Both tumors of renal and of adrenal origin are capable of undergoing secondary degenerative and malignant changes, rendering their histological features almost identical.

**Krieg, A.: Abscess of the Kidney Cortex and Its Relation to Paranephritic Suppuration** (Ueber den abszess der Nierenrinde und seine Beziehung zur paranephritischen Eiterung). *Beitr. z. klin. Chir.*, 1916, xcix, 144.

The patient in the case reported by Krieg was a girl of 25. The history showed influenza and frequent neck inflammation. The present disease began suddenly with pains in the right lower abdominal segment, high fever, tendency to vomit, etc. Appendicitis was diagnosed and a laparotomy done. The appendix was found to be normal. On the under pole of the right kidney a cherry-sized tough growth was felt. On freeing the kidney this was found to be a cortical abscess. About 20 abscesses from the size of a pin to that of a pea were found scattered on the surface of the kidney. The kidney was extirpated and recovery has persisted for the two years since the operation.

The author thinks that the observations are of importance with regard to unilateral kidney abscesses, in that the case throws light on the method of development of such abscesses. Itself of hæmatogenous origin, the cortical abscess had directly attacked the fibrous capsule and involved the neighboring tissue. By this means the way was opened to the fatty capsule and it is seen that the developed



paranephritic abscess condition had its origin in the cortical abscess.  
W. A. BRENNAN.

**Wilk: Surgical Treatment of Nephritis** (Chirurgische Behandlung der Nierenentzündung). *München med. Wchnschr.*, 1916, lxiii, 76.

Wilk reports on four cases of nephritis occurring in wounded soldiers in which medical treatment was of no avail, but in which surgical intervention gave excellent results.

In each of the four cases decapsulation of one kidney was done under local anæsthetic supplemented by etherization during isolation of the kidney. After operation the renal activity became energetic in all four cases.

In these cases the author thinks it is not so much a question of anatomopathologic alteration in the kidney but rather a functional disturbance, a compromising and diminution of the renal activity due to tightening and compression by adipose and connective tissue which envelops it and which has passed into the cicatricial state after inflammation.

Decapsulation is clearly indicated in such cases and if this procedure in the case of one kidney does not suffice to effect functional activity then the second kidney should be operated upon.

W. A. BRENNAN.

**Kretschmer, H. L., and Gaarde, F. W.: The Treatment of Chronic Colon Bacillus Pyelitis by Pelvic Lavage.** *J. Am. M. Ass.*, 1916, lxvi, 2052.

The authors refer to the always open question as to the possible dividing line between pyelitis and pyonephrosis, with abscess formation in the parenchyma. General treatment is not discussed, only the results from lavage. The group treated includes suitable cases only, calculus, tuberculosis, etc., being excluded. Necessary conditions for the treatment were: (1) The urine had to be free from pus. (2) Cultures obtained by ureteral catheter had to be sterile.

As a rule the growth of the colon bacillus was easy to obtain on plain agar, although various combinations were used. In certain of the women treated it was necessary to treat the bladder long after the kidney had cleared up, thus emphasizing Bauer-eisen's teaching as to the lymphatic channels. All foci elsewhere should receive attention. One per cent silver nitrate was the main agent depended on, an average of 5 to 10 ccm. being used. The treatment was resorted to every five or six days. Various symptomatic treatments as well as vaccines were resorted to. Of 14 cases so treated, bacteriologic cures were obtained in 11 instances. From one to eight injections were required. The authors believe that this treatment is more certain and speedy than any other advised and that failure signifies some such complicating factors as stone or tuberculosis.

F. R. CHARLTON.

**Gilpatrick, R. H.: Nephropexy.** *Boston M. & S. J.*, 1916, clxiv, 825.

The author presents a critical review of the most common operative procedures for permanent nephrofixation, most of which, because resulting in functional renal deterioration, should be discarded. Nephropexy as a curative agent in many obscure cases has resulted in failure, because too much was expected from an operation which does not and cannot relieve a disease process or new-growth, but a purely mechanical defect. This must be accomplished without deterioration of organ or function, and success depends upon strict adherence to principles of physiology, to which the sling, basket, and hammock operations, which constrict the kidney, are fundamentally opposed.

The author's procedure is as follows:

After freeing and delivering the kidney through the usual large incision at the lower border of the last rib, the fibrous capsule is incised from one pole to the other along the convexity, and entirely freed from the posterior surface of the organ. The posterior flap of the capsule is then turned back and three or four sutures passed through it, each by an encircling stitch, so as to firmly grasp a generous amount of capsule. By drawing upon these sutures, the capsule flap is rolled backward leaving the entire posterior kidney surface bare. Three or four sutures are similarly passed in the edge of loosened capsule over the convexity. The kidney is then replaced and the sutures brought out through the muscle and fascia and tied on each side of the wound, while the uppermost sutures are brought out close to the rib. When all sutures are tied, the posterior surface of the kidney is accurately approximated to the aponeurotic covering of the quadratus lumborum and the area of agglutination, to be relied upon for support, must average at least four square inches. The muscular edges, the fatty layer, and the skin are sutured without drainage. Stress is laid upon keeping the wound dry throughout the operation, and avoiding injuring or including nerves in the supporting sutures.

Ten cases have been operated upon according to this technique without consecutive kidney-embarrassment. The average stay in the hospital was 17 days. All wounds healed by first intention. All patients reported freedom from symptoms present before operation.

The author offers the following noteworthy conclusions:

1. A mechanical problem is best solved under good mechanical principles.
2. Success is dependent upon the degree to which normal anatomical and physiological conditions are approached.
3. The kidney may not be wounded, fixed, or constricted with impunity.
4. Decapsulation, either partial or complete, does not impair kidney function.
5. The most rational method of securing the kidney in position after it has become a wanderer

to such a degree as to demand operation is that of removing the cause and aiding in the reconstruction of a natural support.

6. Any permanent artificial support is dangerous if not completely destructive to the kidney's functional activity.

7. The rolled-up and transfixed capsular flap offers a perfectly adequate hold for one end of the anchorage, and the muscular and fascial layers of the loin the same for the other end, without sutures which emerge through the skin.

8. If the anatomical relations of the kidney cannot be permanently readjusted without destruction of its functional activity it should be either let alone or removed.

M. KROTOSZYNER.

**Pedersen, V. C.: A Seven-Glass Urinary Test.**  
*N. Y. M. J.*, 1916, ciii, 867.

The necessity of a clinical means of recognizing prostatic disease apart from seminal vesicular disease and of vesicular disease of one side apart from that of the opposite side, and likewise of the prostate, induced Pedersen to evolve the procedure described. He does not claim that it is absolutely accurate but says that it will furnish the clinical basis of operation very satisfactorily by demonstrating whether the pus is chiefly or solely in the prostate as distinguished from the vesicles or vice versa, or in one vesicle independently of its fellow or of the prostate gland.

The author dwells upon the anatomy of the organs in question, and shows with the aid of illustrations how this test can be logically carried out. He performs this test by two methods, the one-stage and the two-stage. The patient's bladder should be reasonably full of urine, or should be filled at the time with normal salt solution. For each specimen 100 to 150 ccm. of urine are necessary.

1. In the one-stage method Glass 1 is obtained by irrigating the anterior urethra as far back as the cut-off muscle before urination. The wash water will show the amount of involvement of this portion of the urethra.

2. Glass 2, which he calls the anterior urethral control glass, is obtained in the same manner and its contents are from the same source. While obtaining Glass 2 it is advisable to massage the urethra upon the catheter in order to express the contents of any infected urethral follicles.

3. Glass 3 is obtained by having the patient pass about 150 ccm. of bladder urine. If the bladder is normal this glass will contain almost solely the contents of the posterior urethra, whose nature will be shown by the microscope, as the products of posterior urethritis in uncomplicated cases, or of this lesion combined with drainage product from the prostate and vesicles in complicated cases.

4. Glass 4, obtained by cautious catheterization with a different catheter from that used in the irrigation of the anterior urethra, will show with a microscope that there is no pyuria, or that if present, its origin is either vesical or renal.

5. Glass 5 is called the prostatic glass, to obtain which there must be considerable urine left in the bladder, or that organ must be distended with normal salt solution. The prostate is then massaged solely along the lateral borders of the lateral lobes where they form a distinct sulcus for the finger in the rectum, between the prostate mesially and the fascia of the pelvis outside it. Great care must be taken to avoid the middle of the prostate along the urethra where the course of the ejaculatory duct lies. After this massage the patient passes 150 ccm. of bladder contents and this presents prostatic secretion, normal or pathological, for examination.

6. Glass 6 is the first seminal vesicle glass, designated in accordance with the side from which it was taken. The author prefers to elect the vesicle which seems to be the least diseased, on the ground that its contents may be far more normal, and he always begins with the normal vesicle if its fellow seems solitary in involvement. After massage of this organ, the patient must evacuate another 150 ccm., which will contain so purely the products of the massaged vesicle as to make the specimen of great clinical value.

7. Glass 7, or the second seminal vesicular glass, is obtained in a similar manner, by massage of the remaining seminal vesicle. In sterility the seven-glass test carried out in the usual manner will show whether or not both testicles are involved and whether or not there is atrophy of the two seminal vesicles.

The two-stage method consists in carrying the examination through Glass 6 in the ordinary way just described, and then postponing Glass 7 until a subsequent visit. The vesicle which at the first sitting was not massaged is now evacuated and the patient empties his bladder into one or two glasses, according to the call for a control specimen. This detail is extremely valuable where tuberculosis is suspected, and the contents of one vesicle must be carefully separated from those of its fellow.

The author illustrates the value of the seven-glass test, with a chart of specimens obtained from numerous cases, and he also gives several case reports.

In conclusion, Pedersen says that this test is not infallible and no such claim is made; but no test possesses the quality of infallibility. It is not self-sufficient and the author does not so state; but few tests are really self-sufficient, not even the X-ray which commonly requires corroboration or is itself only corroborative. The seven-glass test requires, first of all, digital skill in massage, as such, and then with the parts of the prostate and seminal vesicles which are to be reached and with those parts of the same organs which are to be avoided during the massage which this test delimits. It will be well for the beginner to study many patients perseveringly before being satisfied with his own skill in the manipulation, and therefore convinced of his own deductions from the test.

J. D. BARNEY.



**Cameron, D. F.: Variations in Renal Function Dependent on Surgical Procedures.** *J. Am. M. Ass.*, 1916, lxi, 1765.

Cameron's work shows that in surgical diseases of the urinary tract the phenolsulphonephthalein test and the blood-urea test are practically parallel although there is one type of case in which the phenolsulphonephthalein excretion is diminished but the blood urea is normal. He also shows that the relief of any type of urinary obstruction increases markedly the percentage of phenolsulphonephthalein excretion accompanied by a drop in the blood urea. The most interesting portion of the article is the result of the determinations of blood urea after operation with nitrous-oxide-oxygen anaesthesia with rebreathing. These patients all showed an increase of the blood urea, some of them quite high. After operations under ether anaesthesia the increase in the blood urea, if any, was much less, hence this small series of cases would fail to support the contention that nitrous-oxide-oxygen-ether anaesthesia has a less deleterious effect on renal efficiency than has a pure ether anaesthesia.

The author summarizes his results as follows:

The agreement between phenolsulphonephthalein and blood-urea tests is, as a rule, very striking, though not infrequently a low phenolsulphonephthalein excretion is associated with a normal or only moderately increased blood-urea concentration.

These tests are of great importance in selecting the most opportune time for operation so far as renal function is concerned.

Following an operation under a general anaesthetic there is, as a rule, an increase in blood-urea concentration. This increase is most marked after operations on the urinary tract and especially on patients who already have diminished renal function. In a small series of cases this increase was slightly more marked following operations under gas-oxygen-ether anaesthesia than following similar operations under ether.

Blood-urea determinations are of great value in the diagnosis and prognosis of uræmic states. Not infrequently blood-urea concentration can be determined when other renal function tests are very difficult or impossible to use.

In this investigation definite symptoms of uræmia in uncomplicated cases appeared when the blood-urea concentration reached 180 to 200.

There is a definite group of patients who have a low phenolsulphonephthalein excretion but a normal or approximately normal blood-urea concentration. Many members of this group withstand a general anaesthetic without any complications due to renal insufficiency.

V. D. LESPINASSE.

**Pedersen, V. C.: The Diagnosis of Ureteral Calculus.** *N. Y. M. J.* 1916, cii, 1069.

This method is not intended as a modification for or as a substitute of that described by Burton Harris, but rather as an application of it to the Brown-Buerger cystoscope. The method of preparing the

wax tip itself and the compound of wax are the same as those detailed by Harris, likewise the technique of passing the wax-tipped filiform into and coiling it within the bladder full of urine or of boric acid water artificially introduced. The sheath of the Brown-Buerger instrument has a very wide fenestrum, which when passed along the filiform guide in the urethra chafes and even causes smart hæmorrhage from the deep urethra in many cases. In order to avoid this the author has devised an obturator having a wide slot at the vesical end and at the handle of the sheath through which the filiform guide is threaded. The obturator protects the mucosa and permits easy introduction of the instrument without pain or bleeding. The distending fluid in the bladder escapes through the slots of the obturator. Then the catheterizing telescope is passed, the distention renewed, and the wax tip brought into view exactly as Harris describes, rotated completely under the eye for demonstration of any scratches and then passed into the ureter. The author leaves the filiform against the stone after rubbing it upon it and then withdraws the cystoscope and the filiform as one instrument. The distance from the eye-piece to the wax tip is almost the exact distance of the stone from the mouth of the ureter. This method will be found direct, simple, and accurate and in adapting the Harris method to the Brown-Buerger instrument the use of a Nitze instrument is unnecessary, for which instrument Harris originally described his technique.

#### BLADDER, URETHRA, AND PENIS

**Legueu, F.: Extraction of Bullets from the Bladder by the Natural Route** (*L'extraction par les voies naturelles des balles de la vessie*). *J. d'urolog.*, 1916, vi, 505.

Fragments of shell or shrapnel balls, on account of their irregular form and sometimes their large caliber, must always be removed from the bladder by the operative method.

Rifle bullets on the contrary being smooth and of a sufficiently small caliber can be removed through the urethra. Legueu has thus removed all such bullets which he has found and considers it the method of choice.

To carry out this procedure it is necessary that the bullet be quite within the bladder, free, movable, and have no concretions. Radiography in two different positions will generally determine some of these conditions, but cystoscopy must be relied on; it alone shows without error the presence, the situation, and the mobility of the bullet, and it alone can show all the conditions which it is necessary to know before proceeding to extraction.

Legueu's procedure is very simple. He uses a No. 00 lithotrite which he has adapted for this purpose, and by touch alone performs the extraction. The instrument is introduced into the bladder by the urethra in the usual way, just as if a stone were to be removed, only that the bullet must be seized



either by the point or by the base, and not transversely. The dimensions of the urethra easily permit extraction. No anæsthetic is necessary unless the bladder is extremely sensitive or the patient cannot stand the proceeding. W. A. BRENNAN.

**Turner, G. G.: Foreign Bodies in the Bladder Resulting from Gunshot Wounds.** *Lancet*, Lond., 1916, cxc, 958.

The author cites three cases of wounded soldiers in the present European War, in which the foreign body had presumably lodged in the bladder at the time of the causality, for in each instance there was some urinary trouble from the outset. The lodgement of a missile in the bladder is an event well recognized in all campaigns. In most museums there are specimens of calculi in which the nucleus is formed by some type of bullet. In the X-ray investigation of such cases plates should be made with the patient in various positions and with the bladder empty and distended. Marked alteration in the position of the shadow will then be a guide as to the freedom of the foreign body in the viscus. A routine cystoscopic examination ought also to be carried out, for there may be some non-metallic foreign body in addition to that shown by the X-rays, or the foreign body may be entirely non-metallic, and a negative X-ray examination is therefore not enough to establish the diagnosis.

It is interesting to observe how the wound in the bladder spontaneously closes. Small foreign bodies always tend to escape with the urine, but those that cannot negotiate the urethra may sometimes be safely removed in the eye of an evacuating catheter. Legueu, using a specially modified lithotrite, has removed rifle and machine-gun bullets per urethram rapidly and without general anæsthesia. For shrapnel bullets, large or ragged fragments of shell, or incrustated foreign bodies, the author considers the suprapubic route the method of choice, and he believes it will certainly be the safest in the hands of those without special training.

H. A. MOORE.

**Saviozzi, V.: Treatment of Gunshot Wounds of the Bladder** (Contributo alla terapia delle ferite d'arma da fuoco della vesica). *Clin. chir.*, 1916, xxiv, 324.

Saviozzi reports two cases of gunshot injuries of the bladder treated by suprapubic cystostomy and tamponing the bladder opening with favorable result. In one of the cases there was found located in the bladder a bullet as well as some spiculæ from the fractured innominate bone.

Gunshot wounds of the bladder are more frequent than any other kind of bladder wounds. Bartels collected 285 such cases, but it is only very rarely that, as in one of these cases, a bony fragment is carried into the bladder by the projectile. Bladder injuries of this kind are classed either as intra- or extraperitoneal. In the intraperitoneal variety the prognosis according to most writers is absolutely

fatal. Although this prognostic conception seems rather exaggerated to the author yet in the statistics of 152 cases, collected by Rivington, of intraperitoneal cases there was no recovery, nor was there a recovery in any of the cases reported by Bartels.

Extraperitoneal injuries have, however, a more favorable prognosis, but it is difficult to determine whether the injury is intra- or extraperitoneal as the early symptoms in both are identical.

Regarding treatment, the prime necessity is to arrest hæmorrhage and assure the flow of urine. Some recommend the *sonde à demeure* in extraperitoneal injuries, others recommend suture of the bladder and a laparotomy in either variety of injury.

As to the treatment adopted by the author, i. e., cystostomy with tamponade of the bladder (with laparotomy also in the first case), he thinks that the brilliant results obtained authorize him to strongly recommend this procedure because it is rapid, safe, and in serious cases can even be carried out under local anæsthesia. In these cases suture of the bladder was technically impossible and in gunshot wounds accompanied by a perivesicular hæmorrhage the difficulties of suturing are such as to favor the simpler and equally safe method adopted by him.

W. A. BRENNAN.

**Davis, E. G.: Vesical Drainage; Historical Review and Presentation of a New Apparatus.** *J. Am. M. Ass.*, 1916, lxi, 1680.

The author reviews the various forms of apparatus used for urinary drainage following suprapubic cystostomy. The ideal apparatus permits no urinary leakage from the time of operation until the fistula is healed; requires little attention; causes no inconvenience to the patient; and is simple and inexpensive.

The author describes and illustrates the apparatus now used in the James Buchanan Brady Urological Institute. Two bottles of 8- and 2-liter capacity rest on a stool or on the floor beside the bed. In the larger one is a vacuum, which is gradually decreased in strength by a leakage of air through a minute capillary glass tube from the smaller bottle. Within the smaller bottle the air pressure is slightly less than one atmosphere, so that by virtue of this difference, the urine is drawn out of the bladder through a catheter and tube into the smaller bottle. As the urine drops into this bottle, it replaces the air which has leaked into the vacuum of the larger bottle. The capillary tube is placed within the vacuum bottle to keep the apparatus as compact as possible.

The air pressure within the urine bottle is regulated by a small U-shaped manometer of glass tubing with a lumen of 5 ccm. For the sake of convenience and safety this manometer is also placed inside the vacuum bottle. In the bend of this tube is a small amount of mercury which, if sufficient pressure is exerted, will permit air to pass in either direction. This furnishes a safety valve which prevents the



pressure within the urine bottle from differing from the atmospheric pressure by more than 20 mm. of mercury, and also prevents the catheter from exerting more than the gentlest suction within the bladder.

The care of the apparatus is very simple. The urine bottle must be emptied when full, and the air in the larger bottle exhausted at least every forty-eight hours. W. E. LOWER.

**Erkes, F.: Manual Expression of the Bladder in a Spinal Injury** (Zur manuellen Expression der Blase bei Rueckenmarksverletzungen). *Muenchen. med. Wchnschr.*, 1916, xliii, 255.

In the case reported by Erkes there was a penetrating injury by a gunshot which traversed the spinal column. The entrance was at the left axillary line and the outlet a little to the right of the spinal apophysis of the tenth dorsal vertebra. There was complete loss of sensation and motion in both lower limbs as well as bladder and rectal paralysis. To avoid catheterization, the author practiced manual expression of the bladder through the abdominal wall, which by this method is completely evacuated.

Laminectomy was done with extraction of some osseous fragments which compressed the dura mater. Later in the day the patient suddenly developed grave abdominal symptoms and died with symptoms of bladder rupture. At autopsy, an ulcerous perforation of the fundus of the bladder was found.

The author thinks that manual expression of the bladder should only be made when there is no evidence of cystitis or any alterations of the vesical walls, but that when this can be assured, the method is capable of giving good service in selected cases. W. A. BRENNAN.

**Thomas, B. A.: Total Cystectomy One and a Half Years After Operation.** *Ann. Surg., Phila.*, 1916, lxiii, 754.

Thomas reports the case of a man of 42, in whom he found cystoscopically, as the cause of excruciating bladder-symptoms, multiple, variously sized, small polypoid tumor formations, completely covering the trigonum and vesical neck. Since various conservative operative measures, including punch operations, fulguration, suprapubic cystotomy with cauterization of the entire trigonum and vesical orifice, had proved inadequate against the rapidly re-forming polypi, bilateral nephrostomy, supplemented by total cystectomy eight months later, was performed. A remarkably quick convalescence ensued. Four months later, on account of recurrence of pain in the perineum and urethra, suggestive of involvement of the prostatic urethra, a radical perineal extracapsular prostatectomy and posterior urethrectomy were performed, supplemented by deep implantation of 50.5 mg. of radium in the perineum for 48 hours.

The renolumbar fistulae were fitted with sterling silver tubes, connected with rubber tubing to a flat receptacle, suspended over the suprapubic

region. The patient at present enjoys good health and has no difficulty in keeping himself dry.

The case, according to the author, marks the first instance in which Watson's procedure, suggested ten years ago, was successfully accomplished, illustrating at the same time the practicability of the utilization of a satisfactory renal drainage apparatus. M. KROTOSZYNER.

**Loumeau: Congenital Stricture of the Urethra** (Retrécissement congénital de l'uretère). *J. de méd. de Bordeaux*, 1916, lxxvii, 134.

Loumeau reports the details of three additional personal cases of congenital stricture of the urethra. This brings the total number of cases of this condition, which has been considered rare, reported personally by Loumeau within the last few years, to twenty. W. A. BRENNAN.

**Shoemaker, G. E.: Primary Carcinoma of the Urethra, Retention of Urine from Obstruction, Restoration of Function by Radium.** *Surg., Gynec. & Obst.*, 1916, xxii, 730.

The urethra has been called the "rarest location" for primary carcinoma. Most cases are merely extensions. In 1908 McMurtry could find only 26 recorded cases. Sielman reports a case relieved by X-ray. Legueu and Chéron of Paris arrested the destructive process for two and a half years with radium.

In the author's case, a multipara of 50 years applied because of complete urinary retention from urethral obstruction. There was no bleeding, no ulceration, and no tumor. The urethra felt through the vagina like a hard, fixed, pencil-sized ridge extending from the retracted meatus backward nearly to the base of the bladder. The edges of the meatus were hard, irregular, nodular, and ridgelike, with but little enlargement or surrounding infiltration. As incontinence would have followed surgical removal, radium was applied by the author in collaboration with Newcomet, while bladder paralysis and cystitis from enormous distention were treated. After nine interurethral applications, three hours each, the patient was able to urinate normally. The urethra was still cordlike. Microscopical diagnosis: squamous-celled carcinoma. Wassermann test for syphilis was negative.

**Rochet: Total Ischiopubic Disconnection of Deep Perineal Fascia in Order to Reach the Deep Urethra and Exteriorize the Prostatovesical Region** (Désinsertion ischio-pubienne totale de l'aponévrose périnéale moyenne, pour mobiliser l'urètre profond et exterioriser la région prostatovésicale). *Lyon chir.*, 1916, xiii, 17.

Rochet refers to the varying procedures which surgeons have resorted to in order to find a relatively easy mode of access by the perineal route to the deep male genito-urinary organs. Young's perineal operation, Boeckel's anorectal operation, and Fiolle's coccyperineal route as well as others are reviewed.

The author, however, finds all these methods limited and in seeking a method for reaching the deep perineal organs and bringing them completely out of the excavation has realized it by a massive mobilization of the whole deep perineum by lateral disconnection of the deep perineal fascia and its complete peripheric detachment from all the osseous ischio-subpubic triangle.

The operation is done in four stages. In the first, the penis and scrotum being tightly drawn up, a reversed V-perineal incision is made. The summit of the V corresponds to the subpubian angle and the sides of the V follow the ischiopubic branches. This is practically Young's incision.

The second stage consists in the stripping of the deep urethra from the rectum as in an ordinary prostatectomy, penetration into the recto-urethral triangle, section of the recto-urethral muscle, and separation of the anterior face of the rectum from the posterior face of the prostate.

In the third stage the membranous urethra is cut through immediately behind the bulb, immediately before the deep perineal fascia. The anterior end of the urethra is slightly loosened up including the bulb and drawn away so as not to mask the field of operation.

The fourth part of the operation consists in an attack on the lateral attachments of the deep perineal fascia and on the deep perineum as far as the internal edge of ischium. This part of the procedure gives complete access and freedom of action on the prostate and lower portion of the bladder.

The author has carried out this operation in two cases of cancer of the prostate and he thinks the operation is indicated in cases requiring extirpation of the cancerous prostate, also when the lower part of the bladder is attacked by localized neoplasms. The high route of approach in such cases is difficult and the field is far from the reach of the finger and instruments.

W. A. BRENNAN.

**Thomas, B. A., Siter, E. H., and Randall, A.:** Amputation of Penis for Carcinoma; Conditions Four and One-Half Years After Operation. *Ann. Surg.*, Phila., 1916, lxiii, 755.

The case is reported of a man of 58, who in October, 1911, had been operated upon for a typical carcinoma of the glans penis, involving the urethra, with metastasis to the inguinal lymph-glands on both sides, and amputation of the penis close to the pubic arch.

Interesting features of the case are: Absence of recurrence, although complete extirpation of the penis with perineal urethrotomy was not done, and good functional result (ability to urinate in standing posture).

M. KROTOSZYNER.

#### GENITAL ORGANS

**Gibbon, J. H.:** The Treatment of Undescended Testicle. *Penn. M. J.*, 1916, xix, 609.

Because incomplete descent of the testicle is usually associated with a patulous condition of the

vaginal process, as in twenty-four of the author's twenty-seven cases, the congenital type of inguinal hernia, if not already present, is likely to develop. The undescended testicle is never as large as the one that descends normally but, contrary to the prevailing belief, it is no more prone to malignant changes.

An incompletely descended testicle in an infant can be drawn much lower down by regular daily efforts of an intelligent mother or nurse. The Bevan operation can be done at three or four years and by careful dissection the testicle almost invariably can be placed in the scrotum, but if not it should be returned to the abdomen rather than be excised.

The incision is the same as for hernia operation. The vaginal process is opened and divided transversely just above the testicle; the upper portion being treated as a hernial sac, and the lower portion is sutured around the testicle as a tunic. This lower portion of the sac is carefully separated from the surrounding structures and the spermatic cord is freely mobilized. This usually permits the testicle to be placed in the scrotum without tension, but occasionally it may be necessary to ligate and divide the spermatic veins and artery. Owing to the free anastomosis between the spermatic artery and the artery of the vas, ligation of the former does not interfere with the circulation in the testicle. A pouch is next made in the scrotum by blunt dissection with the finger, and the testicle with its tunic is placed therein. Retention sutures are not necessary except for a purse-string which is loosely tied about the opening in the pouch. The inguinal canal is closed over the cord as in the Ferguson operation for hernia. In 22 operations there were no deaths, no serious infections, and no post-operative disturbances of the testicle. In all 7 cases recently traced the testicle is painless, movable, and in the position in which it was placed at operation.

J. B. CARNETT.

**Levy:** Treatment of Gunshot Wounds of Testicle (Zur Behandlung der Hodenschüsse). *Muenchen. med. Wchnschr.*, 1916, lxiii, 253.

Testicular war wounds like other wounds of war are generally infected and with the patient under an anæsthetic, the wound should be cleaned, washed, and treated as an open wound. Infection is carried very easily into the serous cavities, but the most frequent and most serious complication in this class of injury is infection of the vaginal sac.

Levy cites two cases, one of which was due to a mine explosion entailing lesions of both testicles, treated with favorable outcome, following the technique recommended by Ritter, which consists in opening up the wound with a bistoury if necessary, followed by lavage of the vaginal tissue, and suturing of the serous cavity.

W. A. BRENNAN.

**Raymondaud, H.:** Paratyphoidal Orchi-Epididymitis (Orchi-epididymite paratyphoidique). *Bull. et mèm. Soc. mèd. d. hôp. de Par.*, 1916, xxxii, 558.

The author gives the clinical details of a case in which there was a total disappearance of the right



testicle, a small indurated stump alone remaining which appeared rather more epididymal than testicular.

Observations of such cases are still too few to give data for a clinical picture. However, in presence of the facts that are known, it can be said, contrary to the general opinion, that these genital complications are far from being rare, and that they are grave in general, because they evolve with a tendency to suppuration and by destructive action cause testicular elimination.

W. A. BRENNAN.

**Del Valle, D.: A New Operation for the Treatment of Varicocele.** *Surg., Gynec. & Obst.*, 1916, xxii, 734.

The operations for the treatment of varicocele are numerous, but none of them have fulfilled all that is required. Del Valle considers the following operation simple and the results better than those obtained by similar procedures.

1. Make an incision 5 cm. long on the external abdominal ring, exposing to view the ring with its cord.

2. Dissect the anterior group of veins, separating it from the other elements of the cord. It is not necessary to dissect the spermatic artery. In all varicoceles it is generally the anterior groups of veins forming part of the cord that is affected; besides, anatomically, the anterior group has a greater number of veins and is more important than the posterior group.

3. Divide the anterior group into two subgroups, anterior and posterior. Place a catgut ligature on the posterior subgroup one finger's breadth above the testicle and a silk ligature on the anterior one two fingers' breadth above the former one, holding the thread.

4. Make an incision on the fascia of the external oblique, within and parallel to the internal pillar of the inguinal canal; introduce a forceps through the incision, directing it so as to come out at the orifice of the external abdominal ring; seize the ends of the silk thread and pull through. Thus the entire anterior group of veins passes through the opening in the fascia, and by means of a stitch it is fixed to it after ascertaining that the testicle has remained at the required height.

5. When the posterior group of veins is the one affected, the operation is the same except that the opening in the fascia is made outside the external pillar of the inguinal canal and not within the internal pillar.

**Loumeau: Secondary Calculi of the Vesicoprostatic Region in Old Prostatics** (Les calculs secondaires de la région vésico-prostatique chez les anciens prostatéctomisés). *J. de méd. de Bordeaux*, 1916, lxxvii, 135.

Where Freyer's operation has been correctly executed, there is often the ulterior appearance of calculi in the vesicoprostatic region, owing to the existence above the prostate of an enormous cavity

into which the alkaline urinary salts are precipitated. The condition is not imputable to the surgeon but is a definite result of the prostatectomy.

Loumeau thinks that prostatectomy should be followed up by disinfection of the bladder as long as the urine is not completely limp; and that the diverticular pocket occurring successive to prostatectomy should be suppressed by a perineal resection, as this pocket is capable of permitting the formation of secondary and even primary calculi indefinitely.

In twelve cases in which Loumeau observed secondary calculi subsequent to transvesical prostatectomy three times they were clearly attributable to post-operative prostatic cavities chargeable to the operation alone.

W. A. BRENNAN.

**Peterkin, G. S.: Calcareous Degeneration of the Prostate Gland.** *Ann. Surg., Phila.*, 1916, lxxii, 681.

The patient, 59 years of age, sustained two traumas to the urethra by falls, followed by copious purulent discharge from the urethra and symptoms of cystitis, which continued for thirteen years, when a progressive enlargement and hardness were noted in the prostatic area. Palpation per rectum revealed a round, smooth, stony-hard mass, the size of a medium-sized orange. Cystoscopy showed general cystitis, trabecular cavity with tenacious pus. The prostatic urethra showed phosphatic masses. The skiagraph revealed a large calcareous mass in the prostatic area, which was removed through a suprapubic cystotomy. The mass weighed 31 grams. Ten days following operation the patient died suddenly from secondary hæmorrhage. Autopsy was refused.

I. S. KOLL.

**Morton, H. H.: Suprapubic Prostatectomy.** *Med. Times*, 1916, xlv, 150.

Morton describes two hypertrophic prostatic cases: one, 73 years old, on whom a prostatectomy was done; the other, 84 years old, upon whom suprapubic cystotomy was done for drainage as preparatory treatment for prostatectomy.

The first patient had led a catheter life for two years. This condition Morton designates as the third stage of hypertrophied prostates. Renal function tests had shown favorable results. Rectal examination demonstrated that the enlargement was high up in the pelvis and for this reason the suprapubic route was chosen. Hagner's bag was used to control hæmorrhage, instead of gauze packing formerly used by the author. Freyer's drainage tube was now supplanted by one one-fourth its size in order to guard against a post-operative fistula. A lesser intake catheter was used occupying a considerable lower level than the outflow tube. A through-and-through silver wire suture was used in closing the wound.

The cystotomy case was done under stavaine spinal anæsthesia. Outside of a bladder hæmor-

rhage five years ago, the patient had been free from trouble until the past few days when difficult urination occurred. For forty-eight hours retention was present, necessitating catheterization. Rectal examination found a middle lobe enlargement. A catheter was fixed in the bladder and continuous drainage allowed after a few days of gradual emptyings. However, the continuous drainage became faulty; the patient flighty and toxæmic. On this account spinal anæsthesia was selected instead of ether. Cystotomy was done and a "jack-stone" calculus removed. The prostate will be removed after the drainage has prepared the patient to withstand a prostatectomy.

Morton considers a low specific gravity (this case 1012) with albumin, pus, and blood as prohibitive from ether or even gas and oxygen anæsthesia. He also considers cocaine unsatisfactory. Spinal anæsthesia with stovaine 0.08, lactic acid 0.02, absolute alcohol 0.02, distilled water 9s ad 2 cm. is his preference.

The author cautions that the patient be slightly inverted after the spinal injection in order to keep the stovaine, which is lighter in specific gravity than spinal fluid, from leaving the lumbosacral region and thus prevent death from paralysis of the respiratory centers.

C. E. BARNETT.

**Perrier, C.: Transvesical Prostatectomy Under Local Anæsthesia** (La prostatectomie transvésicale sous anesthésie locale). *J. d'urolog.* 1916, vi, 509.

Perrier reviews the various attempts which have been made to carry out prostatectomy under local or regional anæsthesia. He points out that in most of these the method has necessarily to be more or less supplemented by a general anæsthetic.

The author's method is a combination of these procedures which he avers has given him full satisfaction as typified in the five cases he reports. In detail the combined method is as follows:

1. Anæsthesia of the abdominovesical wall by infiltration of novocaine adrenalin solution 1:200, the quantity used varying according to the stoutness of the subject.

2. Anæsthesia by infiltration with the same solution of the bi-ischiatic line. This will allow of deep, painless injections.

3. The left index-finger being introduced into the rectum, injection is made with long needles (12 to 15 cm.) under the prostatic capsule. According as the liquid is injected the capsule is felt to rise and extend.

4. Injection with similar needles of the sacral nerves with a solution 1:100.

Perrier is of the opinion that his cases show not only the harmlessness of the procedure but the pos-

sibility of applying it in cases which are most difficult from a technical point of view; i.e., with very obese subjects where the prostate can only be exposed with much difficulty. Sloughing of the edges of the wound, as noted by Legueu, has never been observed. In conclusion he thinks that a prostatectomy can be performed under local anæsthesia with the same facility as a hernia or goiter operation.

W. A. BRENNAN.

## MISCELLANEOUS

**Lydston, G. F.: Sex-Gland Implantation.** *J. Am. M. Ass.*, 1916, lxi, 1540.

The author gives an exhaustive summary of his previously published experimental work in sex-gland implantations with material taken from dead bodies and reports four additional cases of successful testicle implantations. In each case transplantation was made into the scrotum of testicle alone or of testicle and epididymis from dead human bodies. One patient, aged 22, has dementia præcox, and fifteen months after operation shows decided improvement. In another patient, aged 29, a double implantation was done because of bilateral complete atrophy of the testes, with restoration of virility and improvement in physical and mental vigor.

The author believes that the sex-gland hormone is the most powerful cell stimulant, nutrient, and regenerator known to medical science, and that sex-gland implantation preserves hormone production for a prolonged period. There is good reason to believe that physiologic and therapeutic advantages may be permanent. In none of the cases thus far observed has the implanted tissue disappeared prior to twelve or eighteen months. The implantation may be repeated.

J. B. CARNETT.

**Loumeau: Diabetes and Prostatectomy** (Diabète et prostatectomie). *J. de méd. de Bordeaux*, 1916, lxxxvii, 135.

Loumeau relates the case of a prostatic of over 70 who for the past three or four years had shown glycosuria which at the time of the examination amounted to 60 grams in twenty-four hours.

A two-stage prostatectomy was done with most excellent results and was followed by restoration of sexual and physical functions. In this case the diabetes which was of arthritic origin had no untoward results on the prostatectomy, which as a matter of fact cured the glycosuria.

Loumeau therefore thinks that, contrary to the general opinion, diabetes except in very severe forms is not an operatory contra-indication.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Stenvers, H. W.:** *The Clinical Significance of Radiographs of the Orbital Region.* *Arch. Radiol. & Electrotherap.*, 1916, xx, 411.

The author endeavors to show the value of making radiograms of the head in atypical positions. He especially presents positions to show the orbital region, citing four cases in which the diagnosis could not have been made either by the stereoscopic lateral or anteroposterior plates.

Before using these new positions in attempting diagnosis, he carried out a number of experiments in which he placed a metal object over the various lines of the anterior fossa and also covered some of the projections with lead foil. In this way he demonstrated that the interpretations by Rhese of certain markings were incorrect.

Owing to the asymmetry of the individual skull and the wide variation in the skulls of different individuals it is impossible to lay down a particular or definite procedure. Each case calls for a slightly different position of the skull on the plate. The author emphasizes the value of taking radiographs of both sides of the individual skull for comparison.

The usual position in obtaining plates for the proper study of the orbital region, as stated by the author, is as follows: "The plate is so adjusted to the face that one edge rests upon the zygoma of the side under examination and the other upon the ridge of the nose."

The conditions demonstrated by this method of examination were as follows:

In the first case, a lymphosarcoma of the orbit, the change demonstrated by the plate was an increase in the size of the fissura orbitalis.

In the second case, a new-growth had caused the absorption of the crista galli and lamina cribrosa, a condition which could not be demonstrated by the usual lateral plate.

In the third case, there was a fracture of the floor of the anterior fossa, and finally a hæmorrhage into the orbit.

W. A. EVANS.

**Bourgeois, H.:** *Twelve Observations of Orbital and Peri-orbital Fistulæ* (Douze observations de fistules orbitaires et périorbitaires). *Prog. méd.*, 1916, xlii, 57.

The author reports on twelve cases of fistulæ in the orbital region of which several were consecutive to war injuries. These were accompanied by lesions of the adnexal cavities of the nasal fossæ and sinuses. In the presence of such a fistula a tertiary fistulized osteitis must always be thought of. Foreign bodies of small dimensions, even small osseous fragments,

suffice to cause these suppurations. Large openings must be instituted and the offending body searched out, the finger aiding the eye.

The osteitis will be curetted until the healthy osseous tissue is reached. It is not less important to effect osseous reparation while avoiding secondary infection. This is best effected by leaving the osseous wound alone and suturing the operative wound as early as possible, allowing only sufficient opening for drainage.

W. A. BRENNAN.

**Rhodes, G. B.:** *Pulsating Exophthalmos.* *Ann. Surg.*, Phila., 1916, lxiii, 389.

In 1908, de Schweinitz and Holloway reviewed the reported cases of pulsating exophthalmos prior to that time. Since then the author has been able to collect 52 cases from the literature, and to these he adds one of his own.

From a study of this series of 53 cases, it appears that 37 of them were of traumatic origin, 9 occurred spontaneously, while in 7 the cause was not given. In the traumatic cases, there was usually a latent period of about 21 days before the first symptom, the bruit, appeared. The average age of the patients was thirty-six. Exophthalmos occurred at later periods varying from a few days to a month after the appearance of the bruit. Pulsation is a later symptom, usually appearing within a few days after the exophthalmos has been noticed. Loss of the pupillary reflex with persistent dilatation of the pupil occurred in many cases, due to the laceration of the carotid plexus of the sympathetic. Almost all cases showed an increase in the ocular tension, but only two developed an absolute glaucoma. Diplopia, hæmorrhages, or œdema of the retina, tortuosity and dilatation of the retinal veins were encountered with great frequency. Certain nerve lesions, such as optic nerve atrophy, paralysis of the motor mechanism of the eyeball due to laceration or pressure on the individual nerves, were commonly noticed.

In these 53 cases, practically all known procedures were employed, with the exception of electropuncture. The author has given an outline of each of these cases with the operation and result, and from them and the other cases previously reported in the literature it seems that ligation of the common carotid is by far the safest operation. In event this fails, one should be guided by the condition of the optic nerve as to further operative procedures, as cures have resulted after long periods. If the nerve is not entirely gone, and seems to be threatened, the orbital operation, commonly known as Sattler's, in which the superior orbital vein is ligated, should be attempted. This operation,

while yielding good results, exposes the patient to the danger from hæmorrhage in some cases.

In the author's case, ligation of the common carotid was followed by a complete cure, although the exophthalmos disappeared very slowly, and was noticeable for more than four months after the operation.

GATEWOOD.

### EAR

**Read, J. S.: The Necessity for Early Diagnosis and Continuous Treatment in Congenital Syphilis.**  
*Arch. Pediat.*, 1916, xxxiii, 441.

The author concludes that the majority of these congenital cases are not receiving the full benefit of modern methods of diagnosis and therapy. The children of parents known to have or to have had syphilis should be considered luetic until proved otherwise. If no clinical signs are apparent, blood examination should be regularly made. If there is a suspicion of a taint in the child and the serum is negative, the parents should be Wassermannized, and if tests are negative the child should be treated and again tested, for often after a small amount of treatment a positive reaction will appear. If there is in the parents any history of chancre many years back, a provocative injection of salvarsan or mercury should be given and often a negative serum will read positive at the next test.

The author draws attention to the various symptoms which in an unsuspected case should arrest the attention and call for a differential diagnosis excluding the presence of syphilis: marasmus in a breast-fed baby showing no signs of indigestion; extensive peeling of the palms and soles a few weeks after birth; onychia; a thinning of the eye-brows in an infant a few months old; alopecia and any eye lesions in the very young; an unexplainable nephritis; a paroxysmal hæmoglobinuria; a hard swollen testicle occurring under one year of age; epiphysitis within the first three months.

As to treatment, the same persistent, selected application of salvarsan, mercury, K. I., and tonics are recommended as in adults, and the treatment should not be discontinued as soon as symptoms disappear, but the course should be guided by clinical signs, serologic and other tests. OTTO M. ROTT.

**Coates, G. M., and Ersner, M. S.: Vaccine Treatment of Chronic Suppurative Otitis Media.**  
*Penn. M. J.*, 1916, xix, 585.

The authors of this paper discuss the vaccine treatment of chronic running ears and report the results of a series of 50 cases treated with autoge-

nous vaccines of their own preparation, the results of complement-fixation tests in 21 of the cases, 21 Wassermann reactions, and 25 von Pirquets. All of the 50 cases observed were inveterately chronic in type. The result obtained was 46 per cent of dry ears up to the time of writing the paper, which was several months after the last case had become dry. Great stress is laid upon the technique of culture taking for vaccine preparation and a plea made for close co-operation between the clinic and laboratory. The technique used was to cleanse the middle ear and canal as thoroughly as possible with cotton swabs or by suction; fill the canal with alcohol for ten minutes; remove and dry by evaporation for fifteen minutes. Then by tube inflation or by suction, a drop of pus was obtained on a sterile platinum loop inserted through a sterile speculum. Sometimes no growth was obtained, evidently from too complete sterilization.

The authors believe that vaccine therapy will permanently stop the discharge in a good many of these chronic ears. Those showing much bony necrosis, especially in the mastoid, cholesteatoma and possibly labyrinth suppuration, would probably not yield good results. They advise neglecting nothing in the way of local treatment of the ear, nose, and throat that may be indicated, but that vaccine should be given in connection with all other accepted methods of treatment.

The reasons for failure to obtain dry ears are suggested as follows: (1) Failure to obtain causative organism; (2) unnecessary contamination; (3) spoiling the vaccine in course of preparation; (4) incorrect dosage; (5) possibly low antigenetic powers of the organism and the contra-indications mentioned above.

A solution of the question of determining the causative organism was attempted and 21 complement-fixations done, in all of which a negative result was obtained. The antigens used were polyvalent strains of several of the ordinary pus-producing micro-organisms. In these same cases 21 Wassermans were all negative, and of 25 von Pirquets, 3 were faintly positive and 4 strongly positive without local evidence of tuberculosis in the ear.

In regard to complement-fixations, the authors conclude either that: (1) It is possible that only a few free amboseptors are circulating in the blood in these cases. (2) Bacteria in discharging ears are too attenuated to stimulate antibody production. (3) A lowered body vitality may antagonize response to infection. (4) The area may be so well walled off that absorption cannot take place. (5) The technique used may not have been delicate enough.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Dean, L. W.:** The Control of Hæmorrhage in More Extensive Operations on the Nose and Jaws. *Laryngoscope*, 1916, xxvi, 913.

Before performing a major operation about the nose, throat, and jaws, the author usually ligates one or more vessels in the neck, then early in the operation the smaller peripheral vessels are seized with hæmostats. Usually some time later in the operation it is necessary to use pressure, hot water, etc., to control hæmorrhage by seepage.

In removing a superior maxilla or half a mandible where it is necessary to invade the palatal or tonsillar region, the author advises the performance of a tracheotomy, and packing the pharynx, the tube being removed just as the operation is completed. An abundance of hot water and a large electric cautery should always be at hand for the control of deep hæmorrhage and for seepages.

The most essential condition in the control of hæmorrhage in major operations is to have a corps of assistants who have been associated with the operator in numerous operations, so that everything for the control of hæmorrhage is done speedily and with precision.

The author has had no experience with the ligation of the large vessels on each side of the neck; the ligation on one side has, with the exception of one case, proved satisfactory. OTTO M. ROTT.

**Thomson, S.:** Malignant Disease of the Nose or Accessory Sinuses; Advantages of Operating Through the Face. *Lancet*, Lond., 1916, cxc, 987.

The author makes a plea for the performance of the Moure operation or lateral rhinotomy for malignant tumors originating in the antronal wall, the roof of the nose, in the antrum, or in the sphenoid. The advantages claimed for this procedure are:

1. In all cases there is no mutilation or disfigurement.
2. Patients will readily consent to the operation.
3. They are left with an intact roof to the mouth and no troublesome obturator is required as in the old operation of excision of the upper jaw.
4. It is much easier after a Moure operation to keep a direct lookout in the nose and its accessory cavities for any suspicion of recurrence.
5. Recurrences are more easily dealt with, either through the nasal orifice, or by repeating the lateral rhinotomy, and patients are less likely to object to this than to a further facial disfigurement.
6. It can be extended to meet the variable conditions met with, or may be combined with other operative steps; for instance, if it is found that the

disease has deeply invaded the orbit this cavity can be cleared out through the same incision, preserving the lower eyelid, sacrificing the eye if necessary. The nasal septum can be removed if the growth has attacked it. The antrum might be further dealt with by an incision through the canine fossa, but the access to the antrum obtained by a Moure operation cannot be improved upon. This may also be combined with the Denker operation. If the floor of the nose is found to be invaded the addition of a Rouge operation can be made.

7. Externally the scar within a few months is so slight as to be almost invisible.

8. Hæmorrhage can be well controlled.

9. The front wall of the sphenoid is brought so well into the field that it is hardly one inch from the surface.

The author describes the technique of the operation and reports two cases in which the Moure operation was performed.

In the first case, endothelioma of the ethmoid and antrum, there was no recurrence after five and one-half years.

In the second case, epithelioma of the left maxillary antrum, there was no recurrence after three and one-half years.

These cases demonstrated the following facts:

1. Both an endothelioma and a carcinoma in the nasal area are susceptible of satisfactory treatment by this method.
2. A history of some standing or exteriorization of the growth do not necessarily invalidate the good results.
3. Dangerous, difficult, and disfiguring operations which were formerly tried can be superseded by modern methods which in the hands of experts are easier, safer, cause no disfigurement, and promise a lasting cure. OTTO M. ROTT.

**Veasey, C. A.:** The Diagnosis and Treatment of Inflammatory Affections of the Nasal Accessory Sinuses. *J. Ophth. & Oto-Laryngol.*, 1916, x, III.

After alluding to the importance of sinus disease as a causative factor in many gastro-intestinal affections, as well as toxæmias affecting other portions of the body, the author considers the sinuses collectively and mentions the well-known symptoms of headache, tenderness, nasal obstruction and discharge, dizziness and vertigo, as well as aprosexia and neurasthenic symptoms in general.

As to diagnostic methods, the author mentions transillumination as one of the best methods of assisting in the diagnosis. Other aids, as the pharyngoscope, X-ray, puncturing and irrigating the an-

trum, and the application of suction to the nose are favorably commented upon.

As to treatment of the acute condition, the author mentions the necessity of securing adequate drainage and ventilation, and this is secured by shrinking the nasal mucosa by the application of a weak solution of cocaine, instead of adrenalin, as the latter is apt to produce a secondary swollen condition greater than was previously present. After the membrane has been shrunken, the author cleanses it with a normal salt solution or with a mild alkaline solution followed by an application of a 5 per cent solution of argyrol and an oil spray. The patient is instructed to douche his nose freely with hot normal saline solution every hour or two, and to take deep inhalations every two or three hours of compound tincture of benzoin and menthol, four ounces of the former and one drachm of the latter, of which two tablespoonfuls are employed in one-half pint of boiling water. General treatment with calomel, saline, aspirin, and phenacetin is recommended.

The indication for the treatment of the chronic cases is likewise, drainage, whether obtained by the correction of obstructing septal deformities or hypertrophied turbinates. After drainage has been obtained irrigations are advised, and when these prove futile, operative interference is justified. Not much faith is held by the author in the beneficial influence of autogenous vaccines. OTTO M. ROTT.

**Berry, H. M.: Radiography in the Diagnosis of Diseases of the Accessory Nasal Sinuses.**  
*Arch. Radiol. & Electrotherap.*, 1916, xxi, 1.

In radiographing the sinuses of the head the author makes use of the following positions: (1) postero-anterior view, (2) lateral view, (3) oblique view, and (4) vertical view.

In the majority of cases the postero-anterior and lateral views alone will give the information desired. The other views elucidate special points not made clear in the postero-anterior and lateral views. Stereoscopic pairs in postero-anterior and lateral positions often give additional information.

The oblique view is made by first placing the patient and tube in the usual position for making a postero-anterior view and then displacing the tube laterally about two inches. This projects the sphenoid sinus to one side of the nose, displaces the petrous portion of the temporal bone clear of the antrum on one side, and brings the ethmoid of one side into fuller view. By making a second exposure with the tube displaced to the opposite side, comparison of the two sides may be made.

The vertical view is made by placing the patient's chin over the edge of a table, the tube being placed above the vertex. This view shows the sphenoidal sinuses side by side.

Examination of the frontal sinuses reveals their extent laterally and vertically, and the depth anteroposteriorly. The thickness of their walls is also manifest and their accessibility through the nose. The presence and location of septa are

determined. These are important factors if a drainage operation is contemplated. The presence of air-cells in the crista galli has a bearing on the possibility of meningeal infection from the frontal or ethmoid sinuses. The determination of the thickness of the walls of the frontal sinus is important for these reasons:

1. A thin posterior wall favors the spread of infection to the meninges.

2. A thin floor favors the spread of infection to the contents of the orbit.

3. A thick anterior wall may make operation very difficult or lead the surgeon to think the sinuses are absent.

Examination of the ethmoid cells gives information as to their size, the total area covered by them, and their relationship to the other accessory sinuses.

The latter point is important in considering the likelihood of infection spreading from one sinus to another.

Radiography of the maxillary sinuses demonstrates the following points: (1) the size; (2) relation to other sinuses; (3) projection of tooth roots through the floor; and (4) presence or absence of an alveolar recess.

The third point is important as a likely avenue of infection in dental caries; the fourth must be considered when drainage operations are contemplated.

The facts to be determined in radiography of the sphenoidal sinus are its size, the thickness of its walls, and its relationship to the sella turcica and the optic chiasm.

The two latter points are very important since the chief dangers in suppuration of the sinus are extension to the meninges, to the optic nerve, or thrombosis to the intracranial venous sinuses. Since the optic chiasm is often in direct relationship to the roof of the sphenoidal sinus, the thickness of the bony wall is a very important factor in determining the likelihood of implication of the optic nerve in sphenoid infections.

G. W. GRIER.

**Arrowsmith, H.: Malignant Hypernephroma of the Ethmoidal Region.** *Laryngoscope*, 1916, xxvi, 909.

The author reports the case of a colored male, 56 years of age, with a history of obstructed left nostril and repeated attacks of profuse bleeding from that side. The mass was removed by snare, a very profuse hæmorrhage ensuing, necessitating tamponing. A few days later the patient went home. The pathologist's report revealing the true nature of the growth, the patient was sent for, and he reported that he had suffered several profuse attacks of hæmorrhage while at home.

Physical examination revealed a distinct mass in the right upper abdominal quadrant and enlargement of a number of superficial glands in that region; many disseminated areas of consolidation in both lungs; a right supraclavicular mass the size of a hen's egg. For the next few weeks there was profuse bleeding. The left nostril was again



filled with a mass and a complete exenteration was decided upon. The left external carotid was ligated and the right supraclavicular mass removed. The nostril was exposed by a lateral rhinotomy after Moure's method and a friable yellowish mass was removed, which had involved and destroyed the entire left ethmoid region and the inner wall of the orbit. Bleeding was profuse and the patient died three hours after leaving the operating room.

The author states that this is the only case in which the nose was involved in a metastatic growth of hypernephroma, although metastatic involvement of the larynx (one case by Menzel) and of tongue (one case by Coenen) are mentioned.

OTTO M. ROTT.

### THROAT

**French, T. R.: The Tonsilloscope.** *N. Y. M. J.*, 1916, cii, 961.

The instruments needed for internal tonsilloscopy or the examination of the tonsil *in situ*, are a lens tube speculum, or tonsil microscope, and a slender lamp which can be placed behind, below, or above the tonsil and buried within the various spaces between the tissues so that its light is not directly exposed to the eye. The tonsil microscope which is made in two sizes, is a slender tube or speculum about six inches long, inside of which at the end of a sliding tube, is a lens of from five to eight diopters, according to the visual needs of the examiner. The distal end of the microscope is beveled and beaded and has an aperture the diameter of which is in one instrument one-quarter of an inch and in the other one-eighth by one-quarter of an inch. The instrument with the largest aperture is intended for the examination of the free face of the tonsil and the capsule as well. That with the smaller aperture is intended for the examination of the capsule only.

The lamp is of one candle power and is enclosed in a small metal case with a glass window at or near its distal extremity. It is attached at an obtuse angle to an electric light shank which connects by a cable with a tungsten battery, balanced in size and power to the candle power of the lamp. The tonsillar substance can, however, be more effectively transilluminated with a double lamp which should be preferred in all examinations in which the tonsil is large enough to hide the glass windows from view.

By this method of transilluminating, the tonsil lights up in much the same way as does a stained glass window brilliantly transilluminated from the opposite side. The outlet of the tonsil microscope is then applied to any and every surface of the luminous tonsil not occupied by the lamp, including a large part of the surface of the capsule even if there are no adhesions to the anterior pillar. Many of the conditions within the tonsil can in this way be seen directly. The meaning of the varieties and shades of coloring is a matter of interpretation

which has been developed from experimental color studies made in association with the anatomical, histological, and pathological findings.

When the tonsil is that of health, or nearly so, it is relatively translucent and permits a considerable insight into its contents. When, however, it is the seat of disease, it is less translucent in proportion, presumably, to the number and virulence of the bacteria in the pathogenic material present and the consequent inflammatory reaction produced by them, so that in extensive disease it is impossible to detect anything beyond collections of detritus and pus lying close to the surface.

Another instrument, which the author calls the external tonsilloscope, is used for the examination of exploratory sections removed from the tonsil at the beginning of operations, and for the study of the tonsil as a whole or in part, after operations. It consists of a simple microscope, on a light screen, and a powerful electric lamp suspended together from a crane. The object in their suspension is to make it possible to conduct the examination without a break in surgical cleanliness. The lens in the microscope has a magnifying power of six diameters. It is fitted into the proximal end of the tube of the microscope and has an adjustable focus. The microscope tube tapers to a size at the distal end which can be readily covered by a section, or the whole of the tonsil. The specimen is caught upon a hook at the distal end and left in position for leisurely study. The lamp is the Nernst, of 350 candle power.

The former procedure, internal tonsilloscopy, is of more practical significance.

The following classification of the conditions found in the tonsils is offered:

1. The tonsil of health.
2. Functional stimulation or mild disease; the doubtful class.
3. Superficial abscesses.
4. Apparently active or large foci of detritus and pus occupying restricted areas.
5. Considerable general disease.
6. Extensive general disease.

The picture of the tonsils as seen through the microscope in the above classifications are then given as follows:

1. The color of a tonsil in health is warm amber, but the passage of light through a thin edge of a tonsil or through a very small tonsil of health, even in an adult, produces a color more like that of rock candy. In the tonsil microscope small arteries are seen coursing upon the surface and to some extent in the stroma, while here and there in the substance of the gland appear small round red spots like flies in amber.
2. In the doubtful class, functional stimulation or mild disease, there is a departure from the normal indicated either by a uniform pink-amber coloring involving the entire tonsil or by hyperæmic blushes covering small areas of the amber field.
3. In the class, superficial abscesses, blind ab-

scesses are seen just under or near the epithelium on the free face of the tonsil which transilluminate as dark or black discs according to their proximity to the surface; the nearer the surface the darker the shade. In the tonsil microscope abscess formations when present may also be found directly under the capsule.

4. The class characterized by apparently active or large foci of detritus and pus occupying restricted areas. The prominent feature found upon examination of this group, with the tonsil microscope and transillumination, is that the hyperæmia is in more or less sharply defined areas set in a field which may not be far removed from the coloring of the tonsil in health.

5. In the fifth class in which there is considerable general disease, there is uniform though comparatively light hyperæmia, indicating that there is quite a number of collections of detritus scattered throughout the tonsil, but probably no pus.

6. The sixth class is marked by extensive general disease, which implies the honeycombing of the crypts and the substance of the tonsils with detritus and pus. The coloring in transillumination is uniform and of the deepest shade seen in the tonsils, and always corresponds to that of the anterior pillar.

The following conclusions have been offered as a result of a study of 666 tonsils in and from 333 operations upon children and the study of tonsils *in situ* in a large number of youths and adults:

1. All enlarged tonsils in subjects above the age of eight years are diseased.

2. Enlarged tonsils in subjects below the age of eight years may or may not be diseased, and whether they are or not, can be determined only by examination with the tonsilloscope.

3. The tonsils in subjects above the age of childhood are often, and without much doubt oftener than we now know, the seats of foci capable under certain conditions of producing local and systemic infections.

4. In many subjects with tonsils in classes 2, 3, and 5 it has been proven that they are the source of systemic infection, and total enucleation holds out the only hope of complete and permanent relief.

5. Tonsils which are the seat of extreme disease and which are, therefore, seen to be excessively hyperæmic, bleed freely when cut into.

6. The inner wall of a peritonsillar abscess can be located and mapped out with ease.

OTTO M. ROTT.

**Adams, E.: Sarcoma of the Tonsil.** *Am. Med.*, 1916, xl, 329.

The case reported is that of a woman aged 58 who had a small ulceration about the size of a dime on the left tonsil. The tonsil was movable but the cervical glands anterior to the sternomastoid muscle were enlarged. The clinical diagnosis of sarcoma was made and the high-frequency current was applied daily, both to the tonsil locally and externally to the glands, but with no effect. At the same

time Coley's serum was used, the injections having been made in the gluteal region, subcutaneously. The dose at first was one minim, but it was pushed to 15 minims when the patient had a severe reaction. There was no influence on the growth, however, consequently radium therapy was used, but the only result was a severe radium burn. The tonsil then was removed by means of a snare and examined microscopically, when a diagnosis of round cell sarcoma was made.

Radium was again used, but in spite of this the glands in the neck and axilla increased and later there was evidence of pulmonary metastasis, with sudden death evidently from pulmonary embolism.

OTTO M. ROTT.

**Kenyon, E. L., and Kradwell, W. T.: A Study of the Physicomechanical Function of the Faucial Tonsil.** *Illinois M. J.*, 1916, xxix, 426.

The author's study resulted in the following conclusions:

1. The tonsil serves as an absolutely necessary factor in providing a channel for the action of the palatoglossus muscle.

2. The function of the tonsil with reference to the palatopharyngeus is to afford support and protection, of great importance to its normality of action.

3. Tonsillectomy serves to destroy not merely a possible lymphatic function of the tonsil but also to either disturb or destroy an important physicomechanical function, one which is capable of being clearly understood.

4. More or less impairment of the action of the depressor palatal muscles must occur in practically all cases following tonsillectomy, regardless of the delicacy of operative technique or the particular form of operative procedure adopted; but delicacy of procedure and method of operation are not of course to be considered as unimportant.

5. To consider the present operation of tonsillectomy as a final settlement of the operative approach to the tonsil is premature and erroneous. The whole tonsil question requires further anatomical, pathological, and operative study, in order, if possible, to readjust the operative approach to the organ to the new knowledge which is accumulating.

OTTO M. ROTT.

**Farrington, P. M.: Tonsillectomy According to the Sluder Technique.** *South M. J.*, 1916, ix, 456.

The author regards a properly performed Sluder operation as the simplest, safest, and best method of performing tonsillectomy. He regards tonsillectomy as a hospital procedure to be performed in the morning, after the patient has been thoroughly examined by an internist and properly prepared for general anæsthesia.

With the patient on his back, under ether anæsthesia, the operator removes the tonsil with the Sluder instrument and fills the tonsillar fossa with a gauze pad. After inspection of the tonsil to see if it is intact, he removes the gauze sponge, inspects



the fossa, stops all bleeding with clamps which he allows to remain on for a minute and proceeds with the other tonsil. In a series of 175 cases operated upon by this method, the author had only 5 failures all of whom were adults.

ELLEN J. PATTERSON.

**Dupuy, H.: A Study of Five Hundred Tonsil Enucleations with the Beck-Pierce Tonsillec-tome.** *South. M. J.*, 1916, ix, 453.

The author claims many advantages for tonsillec-tomy performed with the Beck-Pierce tonsillec-tome, basing his opinion on data obtained in five hundred consecutive cases operated upon with this instrument by a modified Sluder technique. Among the advantages he claims that enucleation can be quickly performed; danger of hæmorrhage is minimized; there is less traumatism and local reaction than by other methods; though he admits these advantages are obtained in operations on children under the age of ten years and that this method is not ideal in operating upon adults.

As to the technique, the tonsil is lifted upward into the supratonsillar region and gently pushed through the ring of the tonsillec-tome with the index-finger. The mass is then seized with a grasping forceps meanwhile keeping the index-finger against the tonsil and the wire loop slowly drawn, thus enucleating the tonsil with a thin layer of capsule and leaving the greater part of the capsule in the fossa as a protective lining.

ELLEN J. PATTERSON.

**Escalada, C.: Fractures of the Larynx** (Fracturas de la larniga). *Prensa méd.*, Argent., 1916, ii, 431.

The author has made an elaborate study of laryngeal fractures. In some cases the mechanism of a laryngeal fracture is evident and does not call for discussion. In others, however, the clinical manifestations admit of different interpretations. Escalada has made six series of experiments on the cadaver, using anteroposterior pressure upon the thyroid, the cricoid, and the laryngeal conjunctive; then repeating this series using transverse pressure. He found in general that a pressure of 55 to 80 kilograms was necessary to fracture the larynx; but that the force varied with the age of the subject and the degree of ossification.

In a case of fractured larynx, the treatment in general will be confined to prevention of asphyxiation pending intervention by a specialist. Tracheotomy is recommended for the prevention of recurrence of asphyxia, but some recommend this as a precautionary procedure to obviate the accidents which might occur.

W. A. BRENNAN.

## MOUTH

**Merritt, A. H.: The Roentgen Ray in Dental Practice.** *Am. J. Roentgenol.*, 1916, iii, 264.

The author discusses the use of the roentgen ray in the following conditions: (1) periapical infections, (2) pyorrhœa alveolaris, (3) missing and impacted teeth, (4) facial neuralgia.

1. Periapical infection. When a tooth loses its vitality it is only a question of time when it becomes infected. The acuteness or chronicity of the symptoms of this infection depend upon the number and virulence of the organisms engaged. If the infection lapses into the chronic state, the pain subsides and the patient is usually unconscious of its presence. A discharging sinus may be present or a blind abscess may surround the root of the tooth. Differentiation between these two conditions cannot be made by the roentgen ray, nor is the severity of the infection disclosed by roentgen examination. Every non-vital tooth should have the pulp removed, the root-canal sterilized and filled to the end in order to prevent trouble which is certain to come unless this is done. If abscess is already present in addition to this, the abscess should be opened through the alveolar process, curetted, packed with sterile gauze, and allowed to heal from the bottom. If the end of a root extends into the cavity, it should be amputated. Teeth treated in this manner are not a menace to health and should not be indiscriminately extracted. Where extraction is necessary it is advisable to first procure cultures for autogenous vaccines, as the secondary constitutional symptoms do not always clear up with the removal of the exciting cause.

2. Pyorrhœa alveolaris. The amount of destruction of bone in this condition is not always correctly shown by roentgen examination. If the necrosis occurs on the labial or lingual surfaces of the tooth, it will not be visible on the roentgenogram. If it occurs on the lateral surfaces only the condition may appear to be worse than it really is.

3. In missing or impacted teeth the roentgen ray is indispensable, not only to demonstrate the presence or absence, but also the relative position, of the teeth in question.

4. Facial neuralgia. If this trouble is caused by pulp nodules, or by enlargement of teeth roots (hypercementosis) the roentgen ray is of great diagnostic value. The author lays great stress on the fact that it is seldom necessary to ray the entire mouth if proper inspection is made previously. Pyorrhœa is easily identified while periapical infections always occur in non-vital teeth. The only thing then left to ray are malposed teeth, which are usually molars.

G. W. GRIER.

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# INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1916

## COLLECTIVE REVIEW

### PRESENT STATUS OF ROUND LIGAMENT SHORTENING AS A SURGICAL CURE IN UTERINE DISPLACEMENT

BY SIDNEY A. CHALFANT, M.D., F.A.C.S., PITTSBURGH

Gynecologist to Allegheny General and St. Margaret's Memorial Hospitals, Pittsburgh; Columbia Hospital, Wilkensburg, Pa.

THERE have been many reviews of the operations for correcting displacements of the uterus during past years. Two of these were, at the time of publication, very complete, that of Franklin H. Martin (1) in 1904 and that of Alfieri (2) in 1911. These two articles have been freely used in the preparation of this review.

We have not included in this review any of the operations for fixation or suspension, either abdominal or vaginal, but have limited it to those in which the round ligaments were utilized. For convenience the following classification has been adopted:

1. Inguinal.
2. Vaginal.
3. Intra-abdominal folding.
4. Fixation to the anterior surface of the uterus.
5. Fixation to the posterior surface of the uterus.
6. Fixation to the anterior abdominal wall.

#### INGUINAL OPERATIONS—ALEXANDER TYPE

Alquié (3) (1844) first suggested this operation and performed it on the cadaver and on animals. The only record that we can find of his work is the report of a Committee of the French Academy of Medicine appointed to investigate the operation. Alquié's description of his technique is as follows:

"With the patient in the horizontal position, the uterus replaced, the surgeon determines the

course of Poupart's ligament and selects a point in the middle of it; at which point an incision is made a little obliquely to the crural arch and about 3 centimeters in length. If the knife is carried too low, a small branch of the superficial epigastric may be cut, which can be promptly tied. The crural arch exposed, an incision is made in it a little obliquely to its fibers and two centimeters in length, always keeping to the middle part of Poupart's ligament. Behind the cellular tissue thus exposed, there appears a point of deep red color enclosed in a sheet of dense cellular tissue; this is the round ligament called the utero-inguinal. Picked up with tissue-forceps, this cellular envelope is opened and the cord is seized and drawn out with careful manipulation.

"The peritoneum presenting at the ring, a delicate incision is made around the cord for the purpose of dividing the cellulofibrous sheath which accompanies it, and it is freed with the handle of the instrument. Finally, by gentle tension, the cord is brought outside—it may be drawn out to the extent of 10 centimeters or more—then a threaded needle is passed through the thickness of the cord and is attached down in the lower end of the incision. The margins of the wound are reunited with two sutures, after which the operation is done in the same manner upon the opposite side."

When one considers that this operation was proposed seventy years ago, the reception accorded to what would today be rather a minor

operation shows very forcibly the wonderful advances of surgery.

After giving an outline of the plan proposed by Alquié, the committee reassured the members of the Academy by stating:

"To this brief description, which will suffice to show the importance of the operative procedure involved, your committee wishes to add before going further that it is all pure theory; that M. Alquié has never performed the operation except upon cadavers, and that he does not seem disposed to employ it in the living subject, except in animals. This assurance once given we may proceed with less apprehension in considering his work."

And they finally gave this very qualified approval:

"The operation (which requires always its duplicate upon the opposite side) not being at all admissible in practice, we have the honor to propose that the Academy give its approval to M. Alquié for having had the prudence not to practice it upon the living subject, and that it recognizes that there exists in his work some anatomical considerations worthy of interest."

In (1882) William Alexander (4) of Liverpool published his article in which he reported three cases. He devised the operation and developed the technique without knowledge of Alquié's work which had been done almost forty years before. His technique is very similar to Alquié's.

"The operation is performed by cutting down upon each abdominal ring, gathering up the ends of the ligaments, freeing each from its nerve, and gradually releasing them by patient and cautious traction from the neighboring tissues, until the position of the uterus, as ascertained by the finger in the vagina, satisfies the operator. The ligament is then stitched to the tissues around the ring, and the loose ends attached to each other on top of the skin or rolled around two pieces of wood, which are fastened together in the middle line."

Adams (5) (1882) of Glasgow had for two years been demonstrating in the anatomical rooms the same procedure but had never performed it on a patient. His technique is practically the same as that described by Alexander:

"An incision made over the external inguinal ring, and a very careful dissection carried downward, expose the pale and straggling fibers of the round ligament as they emerge from the ring and take attachment to the dense areolar tissue of the mons veneris. When these fibers are grasped by the forceps *en masse* and steady traction is made, it is found easily practicable

to draw them freely outward to the extent of one or more inches. In the dissection care should be taken to exclude the inguinal nerve, for its rupture under traction implies considerable pain. Under the necessary traction the peritoneum does not follow the ligament as it is extruded, but separates and peels off. There is, therefore, little risk of an inguinal hernia resulting, and any such apprehension is reduced to a minimum when it is borne in mind that inguinal hernia does not commonly occur in the female. The incision, about two inches in length, should be made obliquely, and directed toward the mesial line, and this oblique direction will be found to facilitate the search for the ligamentous fibers much better than a vertical opening. The search for the fibers of the ligament must be made cautiously, and with much patience and little haste, for this is the difficult part of the operation. When fairly exposed, clearly traced, and isolated, they should be grasped by broad pointed forceps—small polyp forceps are very suitable—and, following the guidance of the ligaments, the forceps should be thrust well into the inguinal ring, and the ligament laid hold of as high as possible. When it begins to yield to the traction, it may be pulled out to any desired extent. Five or six catgut ligatures passed over and under the ligament will sufficiently ensure its attachment to the surrounding tissues, while separate ligatures close the wound, excepting at the most dependent part. Antiseptic dressing, strict rest in bed, and the action of the bowels restrained for a few days by means of opiates, should suffice for the after-treatment."

There have been many modifications of the technique of Alquié-Alexander-Adams. The opening of the inguinal canal was advocated by Bompiani (6), Roux (7), Kocher (8), Chalot (9), Gardner (10), Cleveland (11), and Edebohls (12). In an effort to increase the applicability of the operation Goldspohn (13) advocated opening the peritoneum at the internal ring and through this opening separating uterine or adnexal adhesions. This was also suggested by Fritch (14), Maly (15), and Kroenig (16). Boisleux (17), for the same reason, combined the Alexander operation with a posterior colpotomy; Peterson (18) with either a transverse or median incision; Sandberg (19) with a median laparotomy; Kreutzmann (20), Kuestner (21), Schlemminger (22), Rumpf (23), and Palm (24) with a laparotomy by means of the anchor incision of Kuestner-Rapin; and laparotomy by the Pfannenstiel incision was used by Spaeth (25), Frantz (26), Werth (27), and Littauer (28).



## FIXATION OF ROUND LIGAMENTS

Duret (29) and Franklin Martin (30) (1896) separate the distal ends of the ligaments from their attachments and bring one across the symphysis above the fascia and tie them together.

Abbe (31) (1896) splits the fascia over the canal, and after separating the distal end from its attachments, uses the loose end as a living suture for the double purpose of closing the canal and fixing the ligament.

Impallomeni (32) (1912), using the Pfannenstiel incision, drills the os pubis from before backward and passes the free end of the ligament through this opening and sutures it to the ligament in front of the opening. A double pointed nail is then driven across the opening.

Figuerola (33) (1913) splits the canal and draws out a loop of the round ligament. By means of blunt dissection and a ligature carrier this loop is passed upward beneath the external oblique, out through the fascia, again back and out and sutured. He thus makes three punctures of the fascia of the external oblique.

The advantages of the Alquié-Alexander-Adams operation are that it does not necessitate opening the abdomen; the shortening of the ligaments is in the normal course of the ligaments; the strongest portion of the ligament is utilized; and it does not interfere with subsequent pregnancy or labor. The disadvantages are: its limited field on account of the difficulty of determining the absence of uterine or adnexal adhesions which contra-indicate the operation; the danger of subsequent hernia; the impossibility of locating and correcting the pathology of other abdominal organs; in some cases painful scars; and as reported by some operators, a rather high percentage of recurrence. The modifications which involve opening the abdomen either by the vaginal or inguinal route have divested the operation of its greatest advantage.

Laparotomy by any of the ordinary methods gives opportunity to care for disease, particularly of the adnexa or appendix, and permits examination of the organs in the upper abdomen. With the abdomen opened it is much easier to shorten the ligaments by some intraperitoneal method than to make additional incisions over the inguinal canals. This type of operation appears to have at the present time a very limited field of usefulness.

## VAGINAL OPERATIONS

Wertheim (34) (1896) seems to have been the first to use the round ligament in vaginal operations. He attaches the round ligaments 1 or 2

centimeters from the uterus to the vaginal wall. In one case he shortened the round ligaments by doubling them on themselves and suturing them with silk.

Guenther (35) (1896) suspends the uterus by the round ligaments by passing a catgut suture from within the abdominal cavity outward through the anterior abdominal wall and tying the sutures on top of the skin.

Kiefer (36) (1896) through the vaginal incision doubles the round ligaments as in Mann's operation.

Vineberg (37) (1896) gives his technique which he has used in two cases. After delivering the fundus, Vineberg passes a suture on either side embracing the round ligament and a portion of the broad ligament adjacent to the uterus. These sutures are carried through the vaginal flaps below the pubic arch at the side of the pelvis and tied.

Byford (38) (1896) picks up the round ligament as close to the pubic end as possible and sutures it to the uterus above its normal insertion. This is combined with suture of the fundus of the uterus to the peritoneum covering the upper portion of the bladder.

Goffe (39) (1897) first delivers the fundus. Then the round ligaments are caught with forceps at a point as far from the uterus as can be drawn to the site of origin of the ligament. This distance is usually 2.5 to 3 inches. The intervening ligament is folded into a loop the tip of which is attached to the ligament distal to the forceps. The point originally caught is then attached to the uterus at the origin of the ligament, and the three segments of the ligament sutured together.

Ries (40) (1901) divides the round ligament at its uterine end and separates it from the broad ligament for 4 centimeters. He then tunnels the anterior wall of the uterus with a knife and draws the ends of the round ligaments into this tunnel from either side and fastens them with catgut.

Childs (41) (1905) folds the round ligaments upon themselves about as in the Goffe operation and also shortens the sacro-uterine ligaments.

Shurman (42) (1913) divides the round ligaments 2.5 centimeters from the uterus and separates the proximal portion from its broad ligament attachments. This is then sutured to the upper surface of the anterior vaginal mucosa.

Vaginal operations on the round ligament are, for the average operator, not easily performed and have not become popular except in the practice of a few men specially skillful in operating by



this route. It is difficult to get an exposure of much of the ligament, and they all depend upon the outer or weakest portion of the round ligament. There would also seem to be danger of causing sufficient traumatism during the operation to produce adhesions and possible trouble during a later pregnancy, and there is no opportunity to examine for and correct the pathology of other abdominal organs. Operations of this type have a limited field in obese patients in whom a laparotomy is undesirable, and possibly in those for whom extensive plastic operations are required, where vaginal shortening of the ligaments would decrease the time of the operation and in this way lessen the risk.

#### INTRA-ABDOMINAL FOLDING

Wylie (43) (1889) seizes the round ligament at its middle, scarifies the inner surface, and sutures the two folds together with the loop to the outer side.

Polk (44) (1888) freshens the inner surface of each round ligament for some little distance along its middle part and sutures the raw surfaces of the two ligaments together, thus making an anastomosis between the bladder and uterus. Ruggi (45) unites a point of the round ligament near the internal ring to a point near the uterus with a single catgut stitch. Bode (46) does practically the same thing, but in addition takes a stitch into the cornu of the uterus.

Mann (47) (1895) catches the ligament with two forceps dividing it into three equal parts. The point at the outer forceps is sutured "under the point where the round ligament is inserted into the uterus." The ligament at the site of the other forceps is then sutured to the outer extremity of the round ligament as it leaves the abdominal wall. In his first operations he used silkworm gut sutures, but later silk or catgut, and finally used several fine catgut stitches along the course of the folded ligament. In this way he has a triple fold of the round ligament.

Jonnesco (48) (1897) freshens the peritoneum at each end of the ligament and sutures these two raw surfaces and the sides of the loop together with silk. The layer of the broad ligament participating in the fold is then united by means of a suture passed in the form of a "U."

Morris (49) (1900) makes a small opening in the peritoneum, draws out a loop of the round ligament for two or three inches, sutures the folds of the loop together, tucks the loop back into the opening of the peritoneum and closes the opening.

Byford (50) (1903) folds the ligaments to the inner side and sutures the ligament one-half inch from the uterine end to a point one-half inch from the internal ring. The inner edges of the loop are touched with a chemical irritant and then sewed together. The end of this fold is then touched with the irritant and stitched forward and beside the bladder about opposite and a little above the level of the *external* inguinal ring.

Bissell (51) (1908) splits the round ligament longitudinally into an anterior and posterior portion. The greatest portion of each half is cut away, leaving three-quarters of an inch of the distal part of the anterior half and the same amount of the proximal portions of the posterior half. These stumps are sutured, one to the uterus and the other to the cut end of the corresponding part of the round ligament, then sutured together and the broad ligament repaired. This is just the opposite of the ordinary operation for lengthening tendons.

Pankow (52) (1912) divides the round ligament at its middle, sutures the proximal end over the internal ring, and the distal end to the uterus, and then the two loops together.

Lorentz (53) (1913) in his inaugural dissertation reviews the various operations and describes what he terms the N-shaped suturing of the round ligament, which he states was first performed by Zarati. This is very similar to the Mann operation in which the ligament is divided into three equal parts. Two loops are sutured into the internal ring, and the other two to the uterus, and the three segments beneath the broad ligament in a groove which has previously been made.

The early operations of this type all depending upon seroseros adhesions furnished the greatest number of recurrences, and for that reason have been largely abandoned. The later ones in which the edges of the round ligament are freshened or the ligaments resected as in Pankow's or Bissell's operations would seem to be difficult to perform and to have no advantages over the more recent operations of fixation of the round ligaments to the anterior abdominal wall. In addition the operations of this type all fold up or resect the intra-abdominal portion of the ligament which is generally considered to be its stronger portion and depend for support upon the distal or weaker portion. This objection may be more apparent than real. When we consider the cases of retroversion that follow incomplete involution of the uterus and ligaments, it would appear that, at least in these cases, the fault was with the intra-abdominal rather than the extra-abdominal portion of the round ligament.



## FIXATION TO THE ANTERIOR SURFACE OF THE UTERUS

Dudley (54) (1890) denudes an oval area on the anterior surface of the uterus down to the vesical fold of peritoneum and a similar area on the inner surface of the round ligament of each side. These raw surfaces are then sutured together, thus fixing the round ligaments to the midline of the anterior surface of the uterus, at a point near the bladder.

Menge (55) (1904) catches the ligament near its middle, draws it toward the midline, and stitches the folds of the ligament together and then the loop across the anterior surface of the uterus on the level of the attachment of the round ligament. The folds of the broad ligament are then attached to the anterior surface of the uterus.

Coffey (56) (1905) seizes the round ligament with its surrounding peritoneum about one and one-half inches from its origin and stitches it by four or five interrupted sutures of catgut to the side and front of the uterus about the insertion of the broad ligament; then fastens the next inch and one-half of the round ligament back to its original insertion with interrupted catgut sutures. The folds of the round ligament are then covered by bringing the peritoneum of the broad ligament over them with a continuous suture of catgut.

Latzko (57) (1908) fixes the most external point possible of each round ligament to the middle of the fundus of the uterus, forming of the redundant portion a loop on the anterior surface, with the convexity down and toward the midline. The inner portions of the two loops are sutured together and to the anterior surface of the uterus. The folds in the broad ligaments are then in turn sutured to the anterior surface of the uterus to close the openings and prevent internal strangulation.

Baudoin (58) scarifies the inner surface of the round ligament, folds it up and sutures it to the cornu of the uterus and to the anterior uterine wall at the level of the cornu.

Jerie (59) dissects the round ligament free for the required distance, makes a tunnel in the anterior wall of the uterine cornu one centimeter long, draws the loop of the round ligament into this tunnel and sutures it at each end.

Willis (60) (1912) brings both round ligaments across the front of the uterus and sutures them together and to the anterior surface of the uterus in the middle one-half inch below the apex. The folds of the broad ligament are then sutured together and to the anterior surface of the uterus

for a short distance, and the suture continued, taking up the folds of the broad ligaments only, down to a point one-half or three-fourths of an inch from the bladder. Sperling (61) (1906), Smyly, quoted by Ashe (62) (1907), and Stewart (63) (1909) describe operations that are very similar to Menge's.

Of these operations, the one devised by Coffey (56) has undoubtedly been the most popular in this country. He (64) in a later article gives in more detail "the principles on which the success of surgical treatment of retrodisplacements of the uterus depends." He states that the support of all the abdominal organs is by folds of peritoneum; that the round ligaments are muscular structures, essentially a part of the uterus, that muscular tissue has only one function, contraction; and that under continued strain the muscle will stretch. It is therefore illogical to depend upon the round ligaments for a constant support. In the operation he describes, Coffey states that the uterus is supported by the broad ligaments, and the round ligaments have time to rest and an opportunity, as they are fixed under the peritoneum with catgut, to shorten and straighten themselves.

Alfieri (2) raises the point that an essential for stability of the correction lies in placing the uterus in its normal anteversion. The more the broad ligament is tensed, and the lower the round ligament is fixed to the anterior surface, the greater will be the elevation and anteversion of the uterus and the less the anteversion.

This objection seems to be met by Coffey (65), who in a more recent article reports the conditions found in five patients re-operated upon for other conditions. In all these the broad ligament was found holding the uterus in perfect position. The round ligaments had regained their normal size and their normal position under the peritoneum. In this paper the author reports 272 operations by his method with two known recurrences, but apparently no report had been secured from a number of the patients. Suttner (66) reports 64 cases by the Coffey method with anatomical cure but symptomatic failure in one, recurrences in two, and one death from conditions having no relation to the ligament operation.

Goldspohn (67) objects to Coffey's statement that the peritoneal folds are the true support of the abdominal organs. He claims that the support from the abdominal walls is an important factor as shown by the number of cases of enteroptosis in patients with relaxed or weak abdominal muscles. The peritoneal attachments of the uterus must become greatly stretched dur-



ing pregnancy, and once stretched they have no power of contraction. Pregnancy is the true test of operations for retroversion and unless patients are examined after they have passed through one or more pregnancies after the operation, no conclusions can be drawn as to the value of the procedure. The round ligaments are composed largely of non-striated muscle fiber and are a part of the uterus itself, and as such they undergo evolution during pregnancy and involution during the puerperium. "The anatomical structure and physiological nature of these ligaments make them a really live and rather intelligent medium for the purposes here aimed at." Rest will not result in strengthening a muscle; this is accomplished by exercise. That rest will not result in shortening the round ligaments is shown by the large number of women who have worn pessaries continuously for years with cure in only two per cent.

#### FIXATION TO POSTERIOR SURFACE OF THE UTERUS

Menge (68) first used the round ligament as a cover for the pedicles after removing diseased adnexa, and by fixing the ligaments to the posterior wall of the uterus prevented a recurrence of the displacement.

Stolz (69) draws each round ligament up across the inner end of the corresponding tube and sutures it to the posterior surface of the uterus with several sutures of silk.

Webster (70) (1901) perforates the broad ligament below the ovarian ligament, from behind forward with a hæmostat, grasps the round ligament and draws the loop through the opening in the round ligament. The loop is then sutured to the posterior surface of the uterus, and the sides of the opening to the round ligament.

Baldy (71) (1902) cuts the round ligaments at the uterine end. The free end is then drawn through the broad ligament below the ovarian ligament and attached to the cornu of the uterus on its posterior aspect directly back of the original point of attachment of the normally attached round ligament. The ends of the ligaments may be cut off to secure the proper degree of shortening and the point of attachment varied to suit the requirements of the individual case.

Franke (72) (1909), without knowledge of the work of Webster and Baldy, devised a similar operation. In young women, in order to avoid interference with pregnancy, after drawing a loop of the round ligament through the broad ligament he fixed it to the side of the posterior surface of the uterus. In older women the two loops

were joined together as well as fixed to the posterior surface of the uterus.

Holleman (73), after Franke's paper, states that he has been using the method for some time. He suggests that if anteversion is required the opening in the broad ligament should be high, but if elevation is desired the opening should be lower. He also sutures the opening in the broad ligament to the round ligament.

Dartigues (74) (1910) describes an operation that is very similar to Baldy's. The loops of the round ligaments are sutured together behind the uterus and if it is feared that the sling may slip, either up allowing the uterus to drop below, or down permitting the uterus to retroflex over it, the sling may be stitched to the posterior surface of the uterus with vertical stitches in the central, least vascular portion. Soresi (75) (1911) proposes to simplify the technique of the Baldy-Webster operation by pulling the round ligament through the broad ligament by the use of an ordinary wire hairpin.

Alfieri (2) (1911) picks up the peritoneum covering the round ligament about 3 or 4 centimeters from the uterus and cuts it with scissors for 1.5 centimeters perpendicular to the course of the ligament. Through this incision a double loop of strong silk is passed under the ligament, the ligament is raised and the peritoneum is stripped back from it for some distance, most on the distal portion. Two ligatures are made a centimeter apart on the ligament, and it is cut between them. The ends of the ligatures are left long.

With a Cleveland ligature carrier the mesosalpinx is perforated about a centimeter from the uterine margin; the ligature upon the distal portion of the resected round ligament is grasped and the ligature drawn through the aperture. On the corresponding side of the posterior surface of the fundus a tunnel 2 or 3 centimeters long is made with a lance bistoury in a nearly transverse direction, passing from the margin of the uterus near the perforation in the mesosalpinx almost to the middle line. By means of the ligature the ligament is drawn through this tunnel until the resected end appears at the median end of the tunnel. Two sutures are placed at each end of the tunnel. They engage the uterine wall, about a third of the thickness of the ligament, and the overlying fleshy bridge. The central stump of the round ligament is then sutured to the peripheral portion with two silk sutures, and the opening in the peritoneum closed.

Schmitz (76) (1913) in order to avoid the serous adhesions of the Baldy-Webster opera-



tion, which is the weakest kind of intra-abdominal adhesion, suggests a modification which he has performed in a few cases. He makes an opening in the peritoneum over the round ligament 3 or 4 centimeters from the uterus and divides the ligament between ligatures. The distal portion of the ligament is then separated from the peritoneum for a short distance. The ligature attached to the distal end of the round ligament is then caught with a Barrett ligature carrier and carried between the layers of the broad ligament to the posterior surface of the uterus underneath its peritoneal covering. A very small perforation is then made in the peritoneum of the uterus in the midline. The ligatures, one from each side, are then tied, uniting the two ends of the round ligaments. The latter are then secured to the posterior wall of the uterus by a few interrupted stitches of fine chromic catgut. The proximal ends of the round ligament are then sutured to the distal end as in Alfieri's operation and the peritoneum closed.

The Baldy-Webster operation, as it is commonly called in this country, or the "sling" operation of the English and French surgeons, is now commonly performed according to Baldy's (77) (1906) later technique by stitching the loop of the ligaments together and to the posterior surface of the uterus. One of the most complete reviews of the end-results of this operation was that by Polak (78) (1913). He reviewed his results in 400 operations, with only 24 not seen either by himself or his assistants after operation. He thus has 376 patients from whom to draw conclusions. Polak found a rather high percentage of complications, as lateral version, prolapsed and cystic ovaries, sigmoid and intestinal adhesions. Relapse occurred in 32 patients and 30 others were wearing pessaries. Polak concludes that this operation should not be selected for heavy uteri with the cervix in the axis of the vagina. Its success depends on a small uterus, a cervix pointing backward, equally developed ligaments, and a careful technique.

The operations of Alfieri and Schmitz would seem to be rather difficult and tedious and liable to at least a part of the complications of the others of this type.

#### FIXATION TO THE ANTERIOR ABDOMINAL WALL

Olshausen (79) (1886) first utilized the round ligament in performing ventrofixation. He passes his suture around the round ligament immediately beside the uterus and then deeply through the abdominal muscles. "This is completed on each side with two or three sutures

which are then firmly tied and thus, not the uterus itself, but the part of it next the round and broad ligaments, is fixed to the abdominal wall." In view of the subsequent development of ventrofixation it is interesting to note that Olshausen states that it is always advisable wherever possible, "to limit the operation to those patients whose conditions or age preclude the possibility of the occurrence of a pregnancy."

Doleris (80) (1898) sutured the round ligaments into the lower angle of the abdominal incision. In his later work (81) (1902) he was careful not to extend his incision below a point 2 or 3 centimeters above the symphysis. On each side of the median line opposite that portion of the linea alba which has been preserved, he makes a small opening through which a loop of the round ligament is drawn and fixed to the under surface of the skin.

Ferguson (82) (1899) seems to have been the originator of this type of operation. He, in his original operation, made a median incision down to the fascia, then a short incision through each rectus, ligating the round ligament one inch from the uterus dividing it proximal to the ligature. The proximal end was then drawn up into the wound on each side and anchored to the peritoneum and the anterior sheath by the rectus. In his later work (83) (1903) instead of dividing the round ligament as in his former technique, he used the stab wound and loop as in Gilliam's operation but also closed the opening to the outer side either by a purse-string suture from the stab wound down to the bladder and up to the uterus or by suturing the redundant portion of the round ligament to the anterior abdominal wall.

Gilliam (84) (1900) modified Ferguson's original technique by pulling a loop of the round ligament through a stab wound to the side of the median incision and suturing the loop to the upper surface of the anterior sheath of the rectus.

Simpson (85) (1903) describes his technique as follows:

"1. Operations upon the lower genital tract, such as curetting, repair of cervix, perineum, etc., are often required, the suspension being but a counterpart to the correction of the other abnormalities.

"2. A median abdominal incision one and one-half to three inches long is made just above the symphysis.

"3. Adhesions to the uterus are freed and lesions of the adnexa are given such attention as they require.

"4. The wound is held wide open by one

retractor, which is drawn straight up, thus making the opening vertical and permitting the operator to look far into the sides of the pelvic cavity.

"5. The round ligament is grasped by a delicate forceps one inch from its uterine attachment and drawn up to the surface of the wound.

"6. A silk suture is passed through the ligament at this point, in such a way as to encircle about three-fourths of its circumference and to include about an inch of that structure in its grasp.

"7. The needle is taken off and both ends of the suture are passed through the eye of a carrier.

"8. The peritoneum is incised just below and in front of the round ligament. The carrier is then inserted and passed directly forward, immediately beneath the peritoneum of the vesico-uterine pouch, to a point on the anterior abdominal wall just above Poupart's ligament and an inch and a half to the side of the median line, where it again emerges.

"9. Both ends of the suture are grasped and the carrier is withdrawn.

"10. One end of the suture is then threaded on a sharply curved needle, which is passed into the abdominal wall so as to grasp peritoneum, muscle, and fascia, again emerging into the cavity.

"When the two ends of the suture are tied, the ligament is drawn into and along the subperitoneal channel made by the carrier. Both round ligaments having been thus secured, the conditions existing are entirely analogous to those of an awning. The uterus represents the frame; the round ligaments and sutures attached, the cords by which it is raised; that part of the abdominal wall caught in the grasp of the suture represents the pulley over which the awning cord runs; and, finally, the peritoneum of the vesico-uterine pouch represents the covering of the awning. When the cords are tightened the uterus is raised just as an awning is. The peritoneum is thus folded loosely over the round ligaments, and when the sutures are tied the uterus is held in normal anteversion, just as truly and securely as the frame of an awning is kept more or less straight up after it has been raised and fastened."

Simpson reports three cases in his paper. In the first two instead of burrowing beneath the peritoneum, it was caught up along its course.

Noble (86) (1903) using the transverse incision through the fascia and a vertical through the recti and peritoneum, locates the ligament at the internal ring by blunt dissection from the outer

end of the incision, and traction on the intra-abdominal portion. The peritoneum is then separated from the round ligament to prevent the formation of a funnel when the ligament is drawn up. A loop of the ligament is then drawn out on top of the muscles and sutured to the under surface of the fascia and if long enough to the loop from the opposite side.

Montgomery (87) (1904) brings the loop of the round ligament beneath the peritoneum of the broad ligament by a suture around the ligament and a ligature carrier; draws it through the fascia and fastens it with catgut to the upper surface of the fascia. In his later papers (88) (1905) and (89) (1906) he advocates the Pfannenstiel incision.

Ill (90) (1903) modified the Gilliam operation by separating the rectus muscle from its anterior sheath, piercing the rectus and peritoneum, drawing out the ligament and suturing it to the under surface of the fascia.

Bardescu (91) (1904) brings the loop of the ligament through the fascia and sutures the two loops together.

Barrett (92) (1905) makes a rectus incision and puts a ligature around the round ligaments two and one-fourth to two and one-half inches from the uterus. He then passes a curved forceps between the rectus and its anterior sheath, punctures the peritoneum at the internal ring and draws a loop of the round ligament out by means of the ligature previously placed. This loop is then sutured to the under surface of the fascia and if long enough the two loops are tied together.

Morisani (93) (1905) ligates and cuts the ligament close to the internal ring and frees the proximal end from its peritoneal covering. This free ligament is drawn through an opening in the fascia and peritoneum, at the outer margin of the rectus; the uterus is drawn up against the abdominal wall and the two ligaments are sutured to the fascia and to each other.

C. H. Mayo (94) (1906) passes a curved forceps laterally from the lower angle of the incision beneath the aponeurosis just over the muscle to the point where the round ligament leaves the abdomen. The point of the instrument then passes over the pulley of the round ligament and along its course, but beneath the peritoneum, to a point from one and one-half to two and one-half inches from the uterine horn, where the peritoneum is penetrated, the ligament is grasped and a loop pulled back through the tunnel. The loops from each side are then sutured together and to the fascia, or if not long enough to perforations in the aponeurosis. Simpson (95)



(1911) showed that this could more readily be performed by using a long forceps curved to a right angle, which he introduced through a puncture in the fascia one and one-half inches to the side of the median incision.

Dudley (96) (1906) by means of a very heavy needle passes a loop of the round ligament from within the abdominal cavity through the internal ring and the fascia, back through the fascia, rectus, and peritoneum, and sutures it to the peritoneum at the point of entrance and of exit.

Campbell (97) (1905) makes a median incision to the peritoneum, retracts the muscle, makes a transverse incision in the peritoneum on each side at the internal ring, draws a loop of the round ligament through this opening and fastens it to the peritoneum and under surface of the fascia.

Freund (98) (1906) folds the ligaments on the anterior surface of the uterus and stitches them, together with some of the fibers of the uterine muscle, to the anterior abdominal wall. Miller (99) (1907) modifies Mayo's operation by perforating the peritoneum close to the internal ring instead of at the point where the ligament is caught. Peters (100) (1907) describes his operation which is the same as that of Simpson in his later paper except that he goes obliquely through the muscle instead of to the internal ring. Benjamin (101) (1909) punctures the fascia opposite the internal ring, catches the ligament one and one-half inches from the uterus, draws it out and sutures it to the upper surface of the fascia. Branch (102) (1910) modifies the Gilliam operation by closing the opening to the outer side of the ligament, as suggested by Ferguson and Simpson, and suturing the loop of the ligament to the under surface of the fascia. Crossen (103) (1910) passes a forceps under the fascia and obliquely through the muscle to a point about one inch from the internal ring, where the peritoneum is penetrated and the ligament caught about one and one-half inches from the uterus. Thring (104) (1910) describes the method he uses which he attributes to Richardson. He divides the ligament at the internal ring, punctures the fascia at the linea semilunaris, pulls the cut end of ligament through this opening and sutures it to the upper surface of the fascia, pulling the fundus of the uterus against the anterior abdominal wall. In addition, with the continuous suture which closes the peritoneum of his median incision, he catches the wall of the uterus in front of the midline. Dicken (105) (1910) modifies the Simpson technique, in cases with marked relaxation of the

ligament, by first suturing a loop of the ligament back to the uterus as in the first step of the Mann operation.

Strobell (106) (1912) modifies the Gilliam operation by making an additional short incision over each pubic spine. A forceps is passed through this incision just above the pubic bone and obliquely outward, the ligament caught and drawn out, the slack in the outer segment of the ligament taken up and the loop sutured to the upper surface of the fascia. Caballero (107) (1913) describes an operation which he has used since 1902 which seems to be exactly similar to Crossen's. Byford (108) (1914) sutures the round ligament at a point one centimeter from the internal ring back to the uterine cornu and the edges of the resulting loop together. This loop is then brought forward beneath the peritoneum, as in the Mayo operation, and attached to the under surface of the fascia.

Talmey (109) (1906) modifies Olshausen's operation by using two sutures on each side, the nearest one encircling the round ligament about 2 centimeters from the uterine cornu. Kohlmann (110) (1910) gives Bumm's technique of drawing a loop of the ligament through an opening in the peritoneum on either side of the abdominal incision and fastening it into the muscle. Vineberg (111) (1911) modifies slightly the Olshausen technique. He fastens each round ligament to the anterior abdominal wall with two catgut sutures, the outer one about 4 centimeters from the uterus, and the inner one encircling the round ligament at its insertion into the uterus. In addition, in many cases, he catches the peritoneum of the uterus in front of the midline with a few of the stitches that close the incision in the parietal peritoneum.

McArthur (112) (1911) splits the peritoneum on the anterior surface of the round ligament one inch from its uterine end to the internal ring. The raw surface of the ligament is sutured to the parietal peritoneum from the internal ring to within an inch and a half of the median incision. Neuhoft (113) (1913) does the same thing except that he does not split the peritoneum of the round ligament.

Neel (114) (1916) gives his modification of the technique devised by Kelly. He separates the fascia from the rectus muscle 4 centimeters to the side of the incision, passes a silk suture through the muscle and peritoneum, picks up the peritoneum of the anterior wall to the internal ring and of the round ligament, to a point one or two centimeters from the uterine cornu where the ligament is pierced, the suture being then carried

back through the abdominal wall to the starting point and tied.

The first of this type of operations, Ferguson's and Gilliam's, were devised to avoid the greater objection to ventrosuspension, that is, the liability to dystocia. The advantages are that it causes no interference with pregnancy or labor; it utilizes the proximal or stronger part of the ligament; it is comparatively free from recurrence and is quickly and easily performed. After the publication of these papers, the objection was made that, as there were two bands across the peritoneal cavity, instead of the one in ventrosuspension, there was a double danger of internal strangulation. This brought out a number of papers in rather rapid succession in which the writers reported their methods designed to overcome this objection.

At the meeting of the Southern Surgical and Gynecological Association, Cincinnati, in 1902, the papers of Ferguson (83), Simpson (85), and Noble (86) were read. In all of which the principles involved are very similar, and were thus summarized by Simpson: the ligaments are to be beneath the peritoneum, are to be directed forward and the proximal or stronger part of the ligament is to be utilized. He stated at that time that the procedure he devised permitted of many modifications to suit the ideas of the different operations. How accurately he foretold the future is shown by the number of modifications devised since that time, which differ only in minor details from the previous operations.

Concerning the danger of internal strangulation, Gilliam (115) (1911) stated that he had never seen or heard of this accident following his operation although it had followed many hundreds of operations by many operators. This seems to be just as true today as it was then, as we have been unable to find any cases of obstruction reported. But as Simpson (85) pointed out, a patient may carry a congenital hernia for a great many years, without ever being aware of its presence, and develop a strangulation when well advanced in life. So it would seem that this objection, even though it is only theoretical, should be given weight. The retroperitoneal operations can be performed just as easily and with practically no more injury to the patient, and are free from this objection. That the results of this form of operation are good is shown by Simpson's (95) results, 97 per cent of anatomical cures. As pointed out by this writer there are three classes of cases in which success of the round ligament operation alone is not likely to be uniformly obtained:

"1. When the ligaments are very delicate.

"2. When the congenital attachment of the bladder is low and that of the sacro-uterine ligaments is high.

"3. When the sacro-uterine ligaments and the base of the broad ligaments have been very much stretched, giving a decided prolapse."

Bovée (116) has repeatedly called attention to the function of the sacro-uterine ligaments as an important factor in the maintenance of the uterus in its normal position. Where descensus of the cervix is a part of the retroversion some form of shortening of the sacro-uterine ligaments is necessary, and unless this is done, the patient will not be symptomatically cured, even if the fundus of the uterus is in its normal position.

The majority of patients requiring correction of their displacements are those in whom it has followed a previous confinement. This points to the necessity of careful supervision of patients after their delivery to secure proper involution both of the uterus and its ligaments. This applies just as forcibly to those patients who have had an operation as to those who have had no such experience.

From this review of the various operations for shortening the round ligaments we would suggest the following as the principles upon which a satisfactory operation depends:

1. It should be quickly and easily performed. As the condition requiring operation has of itself no mortality, any operation for its correction should involve the least possible risk.

2. It should have a minimum of recurrences.

3. It should not interfere with subsequent pregnancy and labor.

4. The ligaments should be beneath the peritoneum, to avoid the, at least theoretical, danger of internal strangulation.

5. The proximal or stronger portion of the ligament should be utilized.

6. The shortened ligament should be directed forward or along the normal course of the round ligament.

7. It should be intraperitoneal to permit exploration of the adnexæ, appendix, or other abdominal organs.

8. It should involve the least possible traumatism to avoid post-operative intestinal adhesions.

9. It should not overcorrect. If the fundus of the uterus is held in contact with the line of incision a suspension or fixation is liable to take place.

It will be necessary to have reports of the end-results in a large series of cases before any con-



sensus of opinion will be reached as to the value of the different procedures.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### SURGICAL TECHNIQUE

#### ANÆSTHETICS

**Pembrey, M. S., and Shipway, F. E.: Observations on the Influence of Anæsthetics on the Temperature of the Body.** *Proc Roy. Soc. Med.*, 1916, ix, *Sect. Anæsthetics*, 1.

The authors make the following statements in regard to heat elimination and production but give no experimental evidence or references to support the statements. "Deep anæsthesia abolishes the regulation of both the loss and production of heat, so that the response of the warm-blooded animals to external heat and cold resembles that seen in cold-blooded animals: a fall of external temperature diminishes, a rise increases the production of heat. It is this fact which complicates the problem. The internal temperature of a patient may show a fall, a rise, or no change according to the conditions involved during the period of anæsthesia. A fall in the rectal temperature from 100 to 97° F. is within physiological range, when the whole extent of the daily variation in temperature is considered, but in the case of an anæsthetized patient subjected to an operation in a warm theater (72° to 74° F.) such a fall may occur within one hour.

"During short operations of slight severity the necessity for precautions against the loss of heat is not urgent, for in an adult there is, owing to the mass of the body, a reserve of heat which is not rapidly dissipated in a warm theater. In such cases the advantages of warm ether, as compared with cold, may not be so apparent. On the other hand, in the case of long operations or an operation upon a patient possessing a low resistance, the difference may be of great practical importance."

W. M. BOOTHBY.

**Gley: The Inevitable Dangers of Chloroform Narcosis** (Sur les dangers inévitables de la chloroformisation). *Bull. Acad. de méd.*, Par, 1916, lxxv, 698.

In discussing a report recently submitted by Reynier on proposed compulsory chloroformization for diagnostic purposes in the French army, Gley calls attention to the inevitable results of chloroform anæsthesia which are quite distinct from immediate or late accidents. These inevitable results are lesions of the liver and kidneys as well as alterations in the blood and general metabolism.

The first two are well known. Regarding the

blood, different experiments have demonstrated that in the course, and especially at the end, of chloroform anæsthesia there is a neutrophile hypoleucocytosis and some hours later a neutrophile polynucleosis. There is a modification in the form of the red globules and a diminution in their number. Chloroform lessens the globular resistance of individuals subjected to anæsthesia.

Gley states that research has shown that chloroform causes an alteration in the organic exchanges characterized by urinary hyperacidity and an augmentation of urinary chlorides and non-oxidized sulphur, etc. Analysis of the blood shows a notable lipæmia accompanied by acetonæmia and often acetonuria.

Owing to these effects of chloroform intoxication the author thinks that the functioning value of the liver and kidneys should be tested before submitting a patient to the effects of chloroform and particularly when successive anæsthesias are contemplated. In fact the author thinks that the habitual use of chloroform should be renounced on account of the accidents that follow its use. W. A. BRENNAN.

**Page, H. M.: Spinal Anæsthesia.** *Guy's Hosp. Gaz.*, 1916, xxx, 212.

For all ordinary cases inhalation anæsthesia is the method of choice, but there remain many cases in which great advantage is to be gained by the use of spinal anæsthesia, by means of which either the whole or the greater part of the shock is done away with and a more complete muscular relaxation is gained. The operations in which this method may be of especial importance are those for acute abdominal conditions, particularly if septic; any prolonged abdominal procedure likely to be followed by shock; amputations; operation on the bones of the lower extremities; and certain genito-urinary operations.

Seventy cases in which the anæsthetic was given in the Trendelenburg position are reported, in which position it is better to combine a general anæsthetic with the spinal, the small amount necessary to keep the individual unconscious having little if any undesirable effect on the patient, who escapes the discomfort of lying prone for a long period.

The infection is given with the patient lying on the side, immediately after which he is turned on the back and the thighs well flexed. Fifteen minutes



after the injection of novocaine and twenty minutes after stovaine the patient is placed in the Trendelenburg position. Twelve cases were operated on without any general anæsthesia. In the remaining 58 there was perfect relaxation in 55. In the three cases of partial failure a deep inhalation

anæsthesia was necessary. There was no case of interference with respiration and no patient died before recovery from the induced paralysis. Nine cases died, but analysis shows that probably in none of these was the spinal anæsthesia responsible.

E. K. ARMSTRONG.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Don, A.: Treatment of Head Injuries in a Casualty Clearing Station.** *Lancet*, Lond., 1916, cxc, 1034.

The author notes the treatment of 150 cases of head injuries operated upon since the war began, most of them in a casualty clearing station which was located in France not far from the trench fighting, and the cases came under treatment soon after the receipt of the injury. Casualty clearing stations are not fully equipped for work. They lack X-ray machines — a very important essential in the management of head cases. The results given by the author were obtained in the absence of X-ray evidence, and as good as they are, they would naturally have been far better with more complete equipment.

The experience in the present war upholds the rule of early operation in all head cases. Travel in motor ambulances is bad for head cases, especially in winter. Delay means extension of sepsis, and sepsis is responsible for the large majority of deaths, either immediate or remote. External scalp wounds, injuries to the cranium, dura, brain, and meninges all require early attention to prevent sepsis, and this can be given with better results, because earlier, where the casualty stations are, than later on the line of communications.

The plan followed is to cleanse the scalp of all dirt, blood, and hair. The field of operation should be guarded by clean towels; the scalp and wound are next painted with tincture of iodine, and the wound is then excised freely, leaving a clean-cut edge which is undamaged to the eye. If there is obvious injury to the skull trephining should be promptly done. A hole three-fourths of an inch in diameter is made at the side of the opening or fissure and the dura examined. The trephine opening may be enlarged with a rongeur, and if there is no blood-clot, opening in the dura, or other injury, nothing more is necessary. If the dura is injured it is slit up and spicules of bone or blood-clot are removed. Probing with a probe, catheter, or finger should be avoided unless definite evidence of the presence of spicules of bone, metal, or other foreign body is detected. It goes without saying that pressure from intracranial blood-clot should be treated in the same way.

The flap incision, which was extensively used in the beginning of the war, and the removal of a big piece of the skull by the de Vilbiss forceps are not suitable methods to use at clearing stations, since

they interfere with subsequent operations that may be deemed necessary.

Shell wounds are prone to be followed by brain abscess because of hair and dirt carried to the brain. The rifle-bullet wounds are less apt to be followed by abscess or other complications. Men with head wounds do not as a rule return to the colors, and lodged bullets should be removed at home hospitals where brain specialists are to be found. It is different in cases where lodged shell fragments are suspected. They are much more apt to induce sepsis and its complications so that when possible, even at a clearing station, the rule is to remove them.

An opportunity to study the results of English surgeons who believe in huge scalp flaps and large cranial openings, and those of the French surgeons who practice the linear or angle incision and small trephine openings, is interestingly commented upon in favor of the latter, which is considered far more appropriate in casualty clearing stations where lack of adequate equipment obtains.

Indications for operation are: (1) the presence of a penetrating wound of the head; (2) fitness of patient to stand a general anæsthetic; (3) the presence of a surgeon with some experience in cranial surgery.

The average operator can always remove dirt from the wound by a clean-cut incision; open the cranium wide enough for the extraction of pieces of bone pressing on the dura or sticking in the brain, to favor drainage of blood or pent-up brain debris and to restore pulsation. These essentials involve but little shock; they require a minimum of time and they are attended with immediate results. When so treated head injuries are followed by primary healing in most cases, and cerebral hernia is the exception.

Though gas infection is rare in head wounds, free drainage should be afforded by plenty of drainage tubes inserted wherever drainage is called for, even in the brain opening. Ample drainage precludes the possibility of dead tissue persisting in wounds, and when devitalized tissue is eliminated, saprophites, like *bacillus aerogenes capsulatus*, can no longer thrive.

After battles only the mild cases should be transferred to the rear. The most serious cases should be retained for some time for treatment on the lines mentioned, which will put them in a position to bear the ill effects of transport. L. A. LA GARDE.

**Cushing, H.: Concerning Operations for the Craniocerebral Wounds of Modern Warfare.** *Mil. Surgeon*, 1916, xxxviii, 601.

Wounds of the head and extremities form a large majority of the total injuries in the present war, as shown by recent statistics. It has been clearly proved that specialization in the treatment of wounds in this war is of the greatest value in returning wounded men to active service in a condition of comparative health.

The importance of all cranial wounds, however slight, is emphasized. Roberts found that in a series of 140 supposedly minor scalp wounds 41.5 per cent had skull fractures with more or less severe intracranial complications.

The author is strongly opposed to the routine treatment, practiced at some first line hospitals, by enlargement of the wound by a crucial incision, elevation of the depressed fragments, etc., and gauze drainage. He cites cases in which the results of this treatment have been unsatisfactory or worse. He believes that in cases of cranial wounds, removal to the base hospital where proper equipment, carefully planned operations, aided by the X-ray can be had, is the wisest course. He advises a flap-incision away from the wound, thorough exploration, closure of the incision with buried galea sutures, supplemented by cutaneous ones (to be removed on the second day) to insure primary healing with scalp protection for the denuded dura or brain; if drainage is advisable, rubber tissue drains in the distant angles of the incision should be used, gauze never. Under this treatment the patient's chances are better, even after a delay of several days, than with an immediate operation at an ill-equipped first line hospital.

The different types of cranial wounds from projectiles are described, with their characteristic symptoms. An important one is the median tangential, or "gutter," wound received on the vertex, involving the lateral expansions of the longitudinal sinus, causing stasis in the large cerebral veins. The symptoms are those of immediate bilateral spastic paraplegia in the severer cases — "longitudinal sinus syndrome." A mild case observed by the author showed weakness and spasticity of both legs. The milder cases, even with depressed fracture, may recover without operation. In the severer cases, with cortical injury, operation should be undertaken only under the most favorable circumstances, the operator being prepared to control hemorrhage from a bleeding sinus by implantation of raw muscle or vulcanized fibrin fibers; ligation to be avoided if possible. The same principles apply in the treatment of posterior wounds involving the occipital lobes and causing central blindness.

In general, the author believes that good results follow a primary operation with closure, even four or five days after the injury; poor results with death from meningitis follow in cases treated at the front in the routine way and packed with gauze.

HORACE BINNEY.

**Browning, W.: The Anatomical Cause of the Frequency of Hydrocephalus in Childhood.** *Med. Rec.*, 1916, lxxxix, 959.

In the production of hydrocephalus two complementary conditions are found, secretion and retention, both processes normal within limits. Unless there is an abnormal damming back there can be no accumulation and it is this phase that the author especially considers.

Many partial and indirect factors have some bearing on this youthful potentiality, narrower passages, softer tissues, thin bones, metabolic growth-errors, etc. But back of these is an anatomical and mechanical peculiarity which is not ordinarily appreciated.

From a mechanical standpoint there are three causes of hydrocephalus: (1) oversecretion, as by a block in the vein of Galen, leading to excessive production of fluid; (2) closure of the outlets from the ventricles, as at the foramen of Munro, the iter, or the three outlets from the fourth ventricle; (3) interference with the efferents from the subarachnoid space. The first two are relatively rare and may occur at any time of life. While the third form may occur at any time of life, there is an anatomical peculiarity which favors its formation in the early years.

There are two general classes of these efferents from the subarachnoid space; one may be called the quadruped or animal type; the other the (postnatal) human type. There may be additional minor outlets as along cranial nerves or by direct absorption through the surrounding tissues.

The animal type of discharge consists of minute channels or vessels that lead from the spinal subarachnoid space along out-going nerves to the extraspinal tissues. In animals these channels persist, whereas in the human they exist only up to the time of birth.

When these avenues become closed there is a compensatory process which gradually relieves the situation and allows for more complete drainage of the subarachnoid space. Pacchionian bodies gradually develop although they do not appear in large numbers until after the twentieth year. It thus follows that the earlier years of life are especially susceptible to hydrocephalus before this compensatory process has become established, and after the closure of the animal type of vessels. J. H. SKILES.

**Vilvandrè, G., and Morgan, J. D.: Movements of Foreign Bodies in the Brain.** *Arch. Radiol. & Electrotherap.*, 1916, xxi, 22.

The authors report two cases in which bullets penetrating the brain subsequently wandered from their original location.

In the first case the bullet moved from the frontal lobe to the wall of the ventricle in the period of two weeks intervening between examinations.

In the second case the bullet moved from the right parietal lobe outward and downward to the occipital lobe in a period of ten days.

Both cases terminated fatally. G. W. GRIER.



**Keschner, M.: Large Endothelioma of the Dura Compressing Both Frontal Lobes.** *J. Am. M. Ass.*, 1916, lxvi, 1913.

Keschner herewith reports a rare case of a colored woman, aged thirty, in whom both frontal lobes of the brain were compressed by a large endothelioma of the dura, diagnosis being verified by the pathologist's report of the necropsy. In this case, exophthalmos was an early symptom, and a post-neuritic atrophy resulted, within a period of five months, in total blindness.

There was an absence of the Babinski reaction, but the abdominals were present. The Wassermann test was negative, and the cerebrospinal fluid was under considerable pressure. The exact location of this growth was not easy to determine, as the symptoms of cerebellar tumor are closely allied to those of frontal tumors.

The author calls attention to the relative value of early and of late symptoms of brain tumor; also to the symptoms of tumor of the corpus callosum. He does not believe that mental symptoms occurring in brain tumor are necessarily confined to frontal lobe involvement.

At autopsy, the brain measured 17 x 12 x 9 cm., and appeared normal with the exception of the tumor mass.

The tumor was attached to the dura in the center of the olivary process of the sphenoid for the distance of one-fourth of an inch, and connected with the brain by a few vascular strands. The microscopical diagnosis was endothelioma.

EMIL C. ROBITSHEK.

**Priani, P.: Clinical Considerations of Lesions of the Hypophysis** (Consideraciones clinicas sobre lesiones de la hipofisis). *Prensa med.*, Argent., 1916, ii, 411.

The author discusses acromegaly and hypophyseal dystrophia. He reports three cases with a greater or less degree of hyperpituitarism, i.e., enlargement of the face, particularly about the inferior maxillary region; extremities enlarged; macroglossia; sexual disturbances characterized by diminution of function or lack of development; ocular disturbances, lateral or bilateral hemianopsia, or complete obfuscation. The radiograph showed a tumor of the sella turcica in each case. The tumor in the first case, that of a man, was of long and slow evolution and was diagnosed as a simple adenoma. The other two cases which were in females, on account of the rapidity of evolution, were diagnosed as adenocarcinoma. The rapid increase in these cases caused a herniation of the growth from its habitual cavity with subsequent compression symptoms.

In these two cases the disturbances of vision were marked. Both of these cases were operated upon by the endonasal method, and the tumors, weighing respectively 100 gr. and 12 gr., were removed. Both patients died.

The author thinks the cases show the necessity

for early diagnosis and treatment, as in advanced cases like the above the tumor is large, and while surgical intervention offers the only chance of relief, yet it is impossible to completely extirpate the tumor by any method now in use.

W. A. BRENNAN.

## NECK

**Barnhill, J. F.: Some Essential Points in the Anatomy and Surgery of the Thyroid Glands.** *Am. J. Surg.*, 1916, xxx, 137.

After a preamble in which he makes a plea that the otolaryngologist should perform the surgery of the head and neck, the author proceeds to the subject in hand. The points of paramount importance in the surgery of the thyroid are: (1) the large blood supply entering the gland at its upper and lower poles; (2) the outer or surgical capsule and the inner or glandular capsule between which the dissection of the gland should be undertaken; (3) the parathyroid glands, one to eight, usually four in number, which lie in the intracapsular space.

The chief dangers of thyroidectomy are the anæsthesia, hæmorrhage, and shock, suffocation from collapse of the trachea, injury to the recurrent laryngeal nerve, and injury to or removal of one or more of the parathyroid glands. Exophthalmic goiter patients are always grave risks, due to their toxic state. To avoid suffocation from collapse of the trachea, a tracheotomy tube should always be at hand to be inserted at the first sign of obstructed respiration.

In the removal of the thyroid gland, the author employs the horseshoe incision through the platysma; after raising the flaps, he makes a vertical incision in the midline and inserts his finger in the intracapsular space between the ribbon muscles and the gland to separate the entire anterior surface of the gland before cutting across the muscles. After the muscles are severed and turned back, the blunt dissection by finger is continued from the upper pole to the point where the inferior thyroid artery enters the gland. This artery is ligated as near the surgical capsule as possible. The author lays stress upon the fact that whereas both the inferior thyroid artery and the recurrent laryngeal nerve lie in a sheath of their own between the trachea and the œsophagus, the artery alone penetrates the surgical capsule of the thyroid and gland, and, if ligated within that capsule, insures the safety of the nerve. He never makes a special attempt to isolate the nerve.

The inferior thyroid artery also marks the limit of safety in regard to the posterior parathyroid glands which lie in the connective tissue close to the entrance of the inferior thyroid artery. In order to avoid the removal of this important structure, the author cuts across the gland substance above this point, and leaves a small lobule of gland tissue *in situ*. He believes that the operation of thyroidectomy for simple goiter should have a mortality no higher than tonsillectomy in adults; exophthalmic

goiter cases should always be handled in consultation with a competent internist, and if possible no surgical procedure should be undertaken until the pulse has reached 120 beats per minute. Hæmostasis is an important factor in the safety of all operations and should be especially carefully attended to in goiter operations.

E. FISCHEL.

**Goetsch, E.: Functional Significance of Mitochondria in Toxic Thyroid Adenomata.** *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 129.

The cause of thyroid intoxication in individuals who show only the presence of circumscribed adenoma has not yet been satisfactorily explained. Pressure of the tumor on surrounding normal tissue causing an expression of normal thyroid secretion into the circulation in excessive amounts has been advocated as the explanation, as has also the theory that the tumor, a foreign body, acts as an excitant on normal tissue thus producing increased secretion with its train of toxic symptoms. It has long been the experience of surgeons that removal of the adenoma is followed by clinical improvement if not by cure. The author has attempted to solve this puzzling problem by a close cytological examination of the tissue removed in cases of goiter.

A typical case of toxic goiter in a middle-aged woman is cited in detail. A goiter of many years' standing after various nervous and physical traumata began gradually to manifest toxic symptoms. At operation a circumscribed foetal adenoma was removed from the right lobe and the isthmus. Operation was followed by more or less immediate improvement and in one year the patient was practi-

cally normal. The usual histological study of the excised adenoma showed nothing to account for a hyperactivity of thyroid substance. The cells lining the follicles were low cuboidal or even flattened, and nowhere was there infolding of the follicles. Colloid was fairly abundant. There was no increase in vascularity. The usual histological examination would lead one to suppose that the adenoma was functionally inactive.

The author attempted to explain the hyperactivity of this seemingly benign adenoma by a close histological study. He chose a technique which shows clearly and easily the presence of structures commonly known as mitochondria granular rods or filaments occurring in the cytoplasm of all cells; being more abundant in the active stages of cell life and diminishing in number as the cell becomes inactive or senile. Therefore it seemed logical that the more active glandular cells should show more numerous mitochondria.

Applying this theory to the adenoma in question by suitable technique of staining, the mitochondria were demonstrated in greatly increased numbers in the cells of the adenoma. Applying the hypothesis to adenomata removed from glands which were clinically inactive, no increase in mitochondria was observed. Frank cases of Basedow's disease were also studied, and they, too, showed a marked increase in the mitochondria in the thyroid gland tissue itself. It would therefore seem probable that the presence of mitochondria in greatly increased numbers is directly correlated with an overproduction of an otherwise normal thyroid gland secretion.

E. FISCHEL.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Peck, G. A.: The Early Diagnosis of Cancer of the Breast.** *Am. J. Surg.*, 1916, xxx, 188.

The author reviews the recent literature, giving in abstract the attitude of various writers toward breast tumors and the symptoms which they regard as valuable in making a diagnosis of these conditions, also the important laboratory tests that have been employed as diagnostic measures.

He makes no claim to originality in the article, but gives a concise and orderly presentation of the clinical symptoms of breast cancer as contrasted with benign growths and calls attention to the various symptoms and methods that are employed in arriving at an early diagnosis.

His conclusions based on his review of the literature are as follows:

1. The clinical signs and history must form the basis for a diagnosis of malignancy in the breast.
2. Serology and other general laboratory tests, as at present perfected, are not dependable for the diagnosis of these cases.

3. Repeated examinations, at regular intervals, are desirable in doubtful breast tumors, but the complete clinical picture should not be waited for before operation is advised.

4. The influence of physiological development and atrophy of the breast, in which a tumor is present, should be kept in mind.

5. Most tumors of the female breast at or near the twentieth year are benign; whereas, at or near the fortieth year they are malignant.

6. Section through or into the tissue of a tumor of the breast is never justifiable for the purpose of diagnosis. Well-defined growths should include surrounding tissue when removed, but ill-defined ones are best removed with one-fourth or one-half the entire mammary gland.

7. Cross-examination of the fresh specimen by a well qualified pathologist, at the time of operation, is safer than examination of frozen sections alone.

8. One should not be content with a partial operation in breast tumors, if there is a question of malignancy. Only the removal of the lymphatics and the entire breast can effect a cure in such cases.



**Learmonth, M. E.: Acute Mammary Carcinoma.**  
*Canad. M. Ass., J., 1916, vi, 499.*

It is estimated that acute mammary carcinoma occurs in about 1 per cent of all breast carcinomata. Of the 40 cases reported, only two are living past the five-year limit. The average age of onset is about 40 years. The first thing noted is usually a lump in the breast during pregnancy. The course of the disease is rapidly fatal in from one to six months unless recognized early and appropriate surgical measures undertaken. The involvement spreads rapidly, giving a massive induration. About one-fourth of the cases show retraction of the nipple. The orange-skin appearance of the skin, due to the blocking of the lymphatics, is a marked feature.

In case surgical intervention is not obtained early in the disease, death follows from toxæmia. In case of a small tumor appearing in a pregnant breast, and upon its increasing in size, the diagnosis lies between acute carcinoma and tuberculosis, because of the rarity of acute infections at this time. Acute infections are usually associated with the nipples. The author advises exploration with the cautery, immediate examination of the specimen microscopically, and radical removal in case it proves to be carcinoma.

HARRY G. SLOAN.

**MacCarty, W. C., and Mensing, E. H.: The Relation Between Chronic Mastitis and Carcinoma of the Breast.** *St. Paul M. J., 1916, xviii, 164.*

From the study of 967 mammary carcinomata and 406 cases of simple chronic mastitides, certain questions and their answers have been evolved: (1) Is carcinoma always associated with chronic mastitis? In this series of cases the association was constant. (2) Is chronic mastitis always associated with carcinoma? In the experience of the authors, it certainly was not. (3) Are there any facts relative to the possibility of precancerous conditions in chronic mastitis which point to a possible etiological relationship between carcinoma and chronic mastitis? There are three distinct conditions of cellular activity in this parenchyma of the mammary acinus which bring chronic mastitis and mammary carcinoma into intimate association and legitimately prohibit the consideration of the one without the consideration of the other. The microscopic pictures of the pathology of chronic mastitis is given, and the authors claim the line of demarcation between the acinus and the stroma is sometimes confused, thereby making it impossible to accurately state whether one is dealing with carcinoma or not.

There are three distinct histological pictures in chronic mastitis, the first being characteristic of all chronic mastitis, the second, characteristic of some specimens of chronic mastitis, the third, in its earliest stages, is associated with the first and second conditions. The third condition is a recognized picture of carcinoma. The first is a benign condition, and with our present knowledge, the clinical significance of the second condition is still un-

determined, although it represents the precancerous histological picture.

From these facts the authors believe that there certainly is an association of chronic mastitis with carcinoma, but cannot state, scientifically, that chronic mastitis is an etiological factor in mammary carcinoma.

The average age of the 962 patients with carcinoma was 47.9 years, in comparison with the average of 40 years of 406 patients with simple chronic mastitis. A discharge from the nipple is present in 8.4 per cent of all carcinomata and 6.6 per cent of all chronic mastitis. Trauma as a possible etiological factor in the development of chronic mastitis and cancer is greatly minimized in this series by the comparatively small percentage of patients in which this factor is recorded in the history. In cases of carcinoma in this series, only 8.6 gave a history of trauma, while 4.4 with chronic mastitis gave similar histories. In this series 13 per cent of the patients with carcinoma and 22 per cent with simple chronic mastitis were unmarried, which minimizes, to a certain degree, the possibility of lactation and its coincident infection.

Pathologically, carcinoma is not a condition which is dependent upon the age of tissues but on some other condition of the tissues. Of all cases of chronic mastitis 37.3 were diagnosed correctly by the clinician; the other 62.7 depended on fresh tissue diagnosis. In 325 of these cases of carcinoma of the breast clinical diagnosis of the glandular involvement showed that only 120, or 36.95 per cent, actually had had it.

These errors emphasize the great value of an immediate fresh tissue diagnosis, in connection with operative interference. The authors believe that practically one out of every five patients with cancer of the breast may be saved from operation if the surgeon has a competent surgical pathologist associated with him in his work.

From the foregoing facts, the authors have emphasized the following five points:

1. Cancer of the breast is always associated with chronic mastitis.

2. The percentage of legitimate error in the clinical diagnosis of simple chronic mastitis and carcinoma is, respectively, 62.7 per cent and 23.9 per cent.

3. The percentage of legitimate error in the clinical diagnosis of the condition of axillary glands is 36.9 per cent.

4. There are three distinct histological pictures of chronic mastitis, the one extreme in its benign condition, and the other extreme in its malignant condition. The mean which may be easily recognized is, at present, doubtful.

5. The association of the two conditions is too close to allow the consideration of one without the consideration of the other.

The authors believe the following to be the true logical plan: (1) Conditions in the breast which are associated with classical clinical signs of carcinoma,

should be treated radically. (2) In the doubtful cases of women near or over 35 years of age, the entire mammary gland should be removed for immediate examination. If primary or secondary hyperplasia be present, nothing more should be done; if tertiary hyperplasia be present, a radical operation should be performed.

In doubtful patients, near or under thirty-five years of age, a wide section of mammary gland, including the pathological condition, should be removed for examination. If primary hyperplasia be present, nothing more should be done. If secondary hyperplasia be present, the rest of the mammary gland should be removed, and, if tertiary hyperplasia be present, the radical operation should be accomplished.

EMIL C. ROBITSHEK.

**Lambrethsen, J.: A Rare Mammary-Tumor** (Ein seltener Mammatumor). *Nord. méd. Arch.*, Stockholm, 1916, 1, *Kirurgi*, 6.

Lambrethsen describes and illustrates a mammary tumor which he classifies as a sebaceous carcinoma. The tumor showed strips of clear cells lying in a groundwork of hyaline connective tissue. He bases the diagnosis on (1) the form of these cells which have the same developmental characteristics as sebaceous glandular cells (They are polygonal with rounded angles so that they are almost oval in form.); (2) on the clear appearance of the cells to which the protoplasmic granules gave at the first glance such a resemblance as to suggest the thought that the sebaceous glands formed the starting point of the tumor.

W. A. BRENNAN.

**Pallasse, E. and Roubier, C.: Primary Tumors of the Pleura** (Les tumeurs primitives de la plèvre). *Ann. de méd.*, 1916, iii, 243.

Primary tumors of the pleura have always been considered a rarity, their existence has even been denied by some. The authors, however, consider the fact of their existence as indisputable, as evidenced by many undeniable cases in the literature. They report three personal cases in detail. The demonstration in each case was made at autopsy. Histologically the three cases were: a malignant lipoma, a malignant tumor of the fibrous tissue, and a benign tumor of the fibrous tissue.

Primary tumors of the pleura may be divided into three categories: benign, mixed, and malignant. Benign primary tumors are rare, but some observations of lipomata, chondromata, and fibromata have been recorded. In addition purely inflammatory neoplasms have been noted (syphiloma and tuberculomata) on the pleural surface. There is a variety of fibrotuberculous pleural hypertrophy which can give rise to sessile and pediculated productions and may attain a considerable volume.

In the class of mixed tumors the authors place the recorded cases of chondrosarcoma, myxofibromatous sarcomata, myxolipomatous tumors and the like. Malignant primary tumors of the pleura, although comparatively rare, are yet met

with more frequently than the two preceding classes. Pleural cancer presents itself in two forms, diffuse and circumscribed. Such tumors have been designated under a variety of appellations, i.e., sarcomatous, endothelial sarcomata, proliferating lymphangitis, etc., but all may be placed in the two classes of sarcomata and endotheliomata. Sarcomata of the pleura are very similar to tumors of the same kind observed in other organs; they may be fusiform, globose, or giant-celled. Endotheliomata occur more frequently than sarcomata. They are ordinarily diffuse, accompanied by abundant hemorrhagic tumefaction, and metastases are more often met with than in sarcomata.

Surgical intervention is or should be confined to cases where the tumor is clearly circumscribed and of considerable volume, so that it shows symptoms of compression. Guyot and Parcelier in 29 collected cases of malignant tumors of the pleura found 7 surgical cases; i.e., those in which there were no metastases. The apparent operability was 27 per cent. Three were operated upon, the others which would have been fit for operation having been found at necropsy. In one of the operated cases the patient was in perfect health two years later.

Although extirpation is rarely attempted, the author thinks that prudent surgical intervention will be able to ameliorate the prognosis where the tumor cannot be surgically removed, particularly when there is an early diagnosis.

W. A. BRENNAN.

**Goullioud and Arcelin: Extraction of a Free Bullet from the Left Pleura After Establishment of an Artificial Pneumothorax** (Extraction d'une balle mobile dans la plèvre gauche après établissement d'un pneumothorax artificiel). *Lyon méd.*, 1916, ccxv, 211.

The case reported by the authors was that of a man who was found to have a movable bullet in the left pleura. Believing that extraction could be more readily accomplished by the prior establishment of an artificial pneumothorax, this was done according to the Forlalani procedure.

One month later when the patient was accustomed to breathing with one lung, a wide incision of the pleura was made, there being no appreciable respiratory trouble. The bullet being displaced a second incision was made in a different intercostal space and the bullet removed.

The double intervention, although it might have been avoided, had the advantage of demonstrating how the patient had been accustomed by his prior pneumothorax to breathe with only one lung. The authors think that while the establishment of artificial pneumothorax is not indispensable in such cases, it is useful for the avoidance of the dangers of a sudden pneumothorax during operation, although of course such total pneumothorax can be prevented in the course of operation.

Nevertheless in pleuropulmonary surgery artificial pneumothorax will find numerous indications, as in cases analogous to this.

W. A. BRENNAN.



**Jaugeas, F.: Two Cases of Mediastinal Tumor Treated by Radiotherapy** (Deux cas de tumeurs médiastinales traitées par la radiothérapie). *J. de radiol. et d'électrol.*, 1916, ii, 92.

Radiotherapy is the only treatment applicable to intrathoracic tumors in which, on account of their volume or their localization, surgical intervention is either impossible or dangerous. The situation of such tumors in a region normally very permeable to the X-rays, deprived of organs susceptible of being altered by repeated irradiations, and allowing multiple ways of access, give very favorable conditions from a technical viewpoint and permit the administration of therapeutic doses and the attainment of the limits of sensibility in the elements of the neoplasm.

The author reports the clinical data of two cases. In one, a woman of 67, irradiation was begun in January, 1911, so that the anterior and posterior faces of the thorax were alternately exposed to weekly treatments. The dosage was 5 H, penetrability 78 B, filtered through a millimeter of aluminum. After seventeen treatments the woman, who had been previously in a very prostrate condition, had recovered sufficiently to travel to Switzerland for recuperation. On her return she had seventeen more treatments and the author reports that all objective symptoms have disappeared. He points out that while the prognosis of her condition early in 1911 was fatal, in December, 1915, her very satisfactory state is a very happy result of radiotherapy.

In the second case treated, a child of 14, the results, while not so satisfactory as in the first case, still show a great amelioration. There is no notable diminution in the size of the tumor, but the activity of the neoplastic elements has been checked and there is a suppression of the toxic products due to it, which has brought about considerable improvement in the general condition so that the child is restored to normal health. W. A. BRENNAN.

#### HEART AND VASCULAR SYSTEM

**Ascoli and Masserini: Projectile in the Right Lobe of the Heart After Traversing the Cava Inferiore** (Proiettile entro l'orecchietta destra del cuore pervenuto attraverso la cava inferiore). *Clin. chir.*, 1916, xxiv, 377.

Preliminary radioscopes of the patient reported showed a piece of shrapnel on the projection of the left iliac wing about the middle point. A second radioscope made one month later showed the projectile in the cardiac circuit.

It was about 7 to 8 mm. in diameter inside the right lobe and it moved its position rhythmically with the movements of the lobe. Although the authors, judging from published cases, think that operative treatment appears to offer the only ultimate hope in such a case, yet they hesitated to operate in this case on account of the patient's condition.

W. A. BRENNAN.

**Bichat: Extraction of a Piece of Shell from the Right Ventricle** (Extraction d'un éclat d'obus du ventricule droit). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1100.

Bichat reports the case of a soldier wounded in the neighborhood of the right lung. Radioscopy showed a foreign body in the left part of the thorax at the external and lower limit of the shadow of the pericardium and heart, which followed the movements of the heart and respiration. Later examinations localized this body in the pericardium situated behind the sixth rib.

Operation performed two weeks later under chloroform consisted in incision over the sixth rib; resection of the rib; longitudinal incision of the pericardium which was found empty. The projectile was felt embedded in the lower extremity of the right ventricle. The ventricle was caught between two fingers and pulled forward, incised, and the piece of shell removed by forceps; some black blood escaped, but a few catgut sutures produced hæmostasis. The pericardium was sutured.

There was no acceleration in the heart movements which remained at 80 until the end of the operation. The projectile weighed more than 3 gr. and was 16 mm. long. The condition appeared to progress satisfactorily for more than a week. On the thirteenth day after operation signs of pericarditis appeared; the cicatrix was opened and a quantity of seropurulent fluid drawn off, but ten days later there was sudden aphasia, Cheyne-Stokes respiration was followed by death in a few hours.

At autopsy the lung wound was shown to be unciatrized; the trajectory contained a small fragment of bone with abundant suppuration. Bichat believes that the pericardic infection originated in the intrapulmonary infection.

This is the fourth published case of extraction of a foreign body from the heart since the war began. In only one of these cases was there a recovery. From a consideration of the general literature of the subject the author concludes that projectiles in the heart, excluding the pericardium, are not well tolerated; that operatory intervention has given better results on the whole than non-interference; and that the subject opens up a new chapter in war surgery.

W. A. BRENNAN.

#### PHARYNX AND ŒSOPHAGUS

**Guttman, J., and Held, T. W.: Carcinoma of the Œsophagus Perforating into the Right Bronchus.** *Med. Rec.*, 1916, lxxxix, 1039.

The author reports a case, the interesting features of which are as follows:

The onset of the disease appeared to be at the end of September, 1915, four months before the patient's death. The primary cause of the death, carcinoma of the Œsophagus, had probably existed for a long time without giving practically any symptoms whatever. There was no dysphagia, no vomiting, no fetor ex ore, etc., up to within a short period before

his death. A fistulous communication between the œsophagus and bronchus had existed for some time. As a result of this, food particles passed from the former into the latter and in the course of time gave rise to bronchiectasis.

The patient was sixty years of age and had suffered from digestive disturbances for ten years. The bronchiectasis gave rise to small pulmonary hæmorrhages and to cough, thus obscuring the clinical picture by simulating tuberculosis.

The absence of pain and the comparative euphoria at a fever temperature of 101 and 102° is interesting.

The choking and coughing spells when the patient attempted to drink is one of the most characteristic symptoms of œsophagobronchial communication.

EDWARD L. CORNELL.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Outland, J. H., and Clendening, L.: Chylous Ascites and Chylothorax Due to Carcinoma of the Stomach.** *J. Am. M. Ass.*, 1916, lxvi, 1833.

A man, 46 years of age, felt well up to six months before examination April 16, 1915. The onset of his illness was sudden. He had a sudden attack of dizziness and vomiting. He did not go to bed, but was weak and dizzy and continued to feel much the same way for two months. He never vomited blood. For three months previous he had been troubled with indigestion, pain after meals, belching and bloating. The bowels were constipated.

March 27, 1915, the abdomen began to swell very suddenly and in a few days was enormously distended. It was tapped April 1st and about a gallon of milky fluid was removed. April 8th it was tapped again and 1.5 gallons of ascitic fluid of the same character removed.

April 17th the abdomen was tapped and over a gallon of milky fluid withdrawn. The chest was aspirated at the same time, three and a half quarts of clear straw colored fluid being removed. The fluid removed from the abdomen was milky in appearance, with a tinge of pink. It contained 1.9 per cent of albumin and fat and did not react to Fehling's solution. Microscopically it showed small fat globules and small specks in constant atomic motion. Leucocytes and erythrocytes were numerous. The patient died May 13th.

When the abdomen was opened at autopsy, about three quarts of milky fluid escaped. The intestines were distended and covered with a lymphatic exudate. The cæcum and appendix were enormously distended. Small lymphatic channels over the surface of the intestine were greatly distended. All the glands of the mesentery were enlarged. The entire mesentery was a thick mass of glands which were soft in consistency. The liver was enlarged and œdematous. The gall-bladder was large. There were no gall-stones. A tumor was present along the lesser curvature of the stomach, extending from the duodenum to well within the pylorus. The glands of the gastrohepatic mesentery were enlarged. No growth was found in the rectum.

EDWARD L. CORNELL.

**Tuley, H. E., and Graves, S.: Chylothorax, Chylous Ascites, and Lymphosarcoma.** *J. Am. M. Ass.*, 1916, lxvi, 1844.

A woman, aged 58, married 36 years, with two children living, had five brothers and sisters, of whom one died of "brain fever," one of typhoid fever, and one of pneumonia, those living being in good condition. The menopause occurred seven years previous without complications. The patient had always been robust, the normal weight being about 200 pounds. For several months she complained of pain in the scapular regions of both sides and could not lie on her back. For a year she had had pain and fullness in the epigastrium after eating.

The author first saw the patient October 4, 1915, for an attack of dyspnœa, the cause of which seemed apparent as the chest was full of sonorous and sibilant rales and the breathing was typical of asthma.

November 1 a careful examination was made of the thorax and the presence of fluid diagnosed in the left pleural cavity. A peculiar feature of the chest findings at this time was the presence of bronchial breathing over the entire left lung, anterior and posterior, with intense flatness over the left base. November 2 a thoracentesis was done through the eighth interspace and three pints of thin, milky white fluid were withdrawn. The appearance was that of pus, but an examination showed it to be free from cells and to be a sterile chylous fluid. The relief from the dyspnœa was almost immediate, there being very little cough following the aspiration. From then until March the total quantity of chylous fluid removed from this patient's chest was 48.25 pints.

At autopsy the head of the pancreas was involved in a tumor as described below. The tail was negative.

The lymph-nodes from the neck of the pelvis, especially those lying in the posterior mediastinal and retroperitoneal spaces, were involved in an apparently primary neoplasm which was growing around the structures in those regions, but did not infiltrate any except the head of the pancreas. The cervical, axillary, supraclavicular, and infraclavicular and bronchial nodes varied in size, the largest being about 2 cm. in its greatest diameter, were encapsulated and moderately firm and, on section, pale flesh color and homogeneous except the last, which were speckled with black. The posterior



mediastinal nodes were much larger, reaching a maximum diameter of 4 cm., but were encapsulated and softer and paler on section. Below the level of the diaphragm the nodes seemed conglomerate in a mass larger than one's fist and involved the head of the pancreas. On section this tissue was moist, pale, homogeneous, and typically like fish flesh; while scattered in it could be seen lobules of pancreatic tissue. The lymph-nodes along the lesser curvature of the stomach, in the gastrohepatic omentum and retroperitoneal along the aorta, were enlarged, those in the gastrohepatic omentum reaching a diameter of 4 cm., while those about the abdominal aorta decreased in size to the region of the bifurcation where they measured about 2 cm. in diameter, but were of the same appearance as those described above.

*In situ* structures about the innominate veins were dissected, primary incision being extended at right angles laterally along the left clavicle. No abnormality or rupture of the thoracic duct could be found. In the posterior mediastinum duct, the œsophagus and vessels were surrounded by the tumor, but none of these structures were invaded macroscopically. The heart, lungs, trachea, œsophagus, aorta, thoracic duct, pancreas, kidneys, and suprarenals were removed *en masse*. The duct was slit open and followed to its beginning branches. Its mucosa was smooth everywhere.

The microscopic diagnosis was lymphoblastoma, malignant lymphosarcoma, round-cell sarcoma.

The final diagnoses were: lymphoblastoma of the cervical, axillary, clavicular, mediastinal, gastrohepatic, abdomino-aortic, and iliac lymph-nodes, invading the pancreas and lung, compressing other structures adjacent to them, and metastasizing in the spleen; chylothorax, bilateral; chylous ascites; gastric ulcers; hæmorrhage into the intestine; chronic endocarditis; chronic aortitis; œdema of the legs; fibrous pleural adhesions, bilateral; superficial ecchymoses; acute dermatitis of the left leg; multiple leiomyomata of the uterus; senile ovaries; post-mortem change in the suprarenals; chronic gingivitis; atelectasis of the lungs.

EDWARD L. CORNELL.

**Chatillon, F.: Spontaneous Pelvic Peritonization in Women** (La peritonisation spontanée du bassin de la femme). *Ann. de gynec. et d'obst.*, 1916, xlii, 146.

Several authors have from time to time shown that certain organs such as the epiploon, colon, etc., can among themselves form a protecting tent over the lower pelvis destined to prevent the spread of suppurative processes into the abdominal cavity.

From a study based on twenty-seven observations made by Beuttner in the Gynecological Clinic of the University of Geneva, in which he studied the exact condition in which the abdomen was found on making a laparotomy, he sketched certain conclusions which he recently published. Chatillon now publishes this study on the same lines based on a much larger number of cases, viz., 100.

Sometimes at a laparotomy the inflamed genital organs are found to be so well protected by their neighbors that they are scarcely seen, the inflammatory process has been spontaneously peritonized and the diseased parts isolated from the abdominal cavity hindering propagation of the infection. The object of the author's research is, therefore, to find if there are any rules according to which the different organs act toward each other or how one or several diseased organs are protected by their neighbors.

The author considers this spontaneous peritonization by means of the rectum sigmoid, cæcum, small intestine, epiploon, etc. He finds that spontaneous peritonization has been produced in 100 cases as follows:

21 times by 1 organ.  
30 times by 2 organs.  
26 times by 3 organs.  
11 times by 4 organs.  
7 times by 5 organs.  
5 times by 6 organs.

While Bliesener found that the grand epiploon and small intestine were the organs most often utilized, the author's research showed that the small intestine and sigmoid were the most frequent. He draws these general conclusions from his study:

1. The annexes descend into Douglas's pouch along the posterior wall of the uterus and are peritonized by adhesions which the rectum, uterus, bladder, etc., form around them. In this case the peritonization will be effected by the organs of the lower pelvis. It will be *low* peritonization.

2. If the annexes for any reason do not descend into Douglas's pouch and consequently remain in good position, peritonization will be effected by the organs situated above them or in their immediate vicinity; i. e., the epiploon, cæcum, sigmoid loop, or small intestine. This process the author designates as *high* peritonization.

3. The combination of these two methods will form a third category which comprises complicated cases where peritonization proceeds at the same time on the part of all the organs. This may be termed *mixed* peritonization.

Hence the general rules for spontaneous peritonization of the pelvis in woman are: (1) by means of the lower pelvic organs, (2) by means of the organs of the intestinal tract, (3) simultaneously by the lower pelvic organs and those of the intestinal tract.

W. A. BRENNAN.

**Beach, W. M.: Some Observations on Hernia in Relation to Intestinal Stasis.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

After reviewing the theories of Keith relative to nodal zones situated at different levels in the intestinal musculature the author makes the following observations:

1. We have tried to define intestinal stasis as a physiologico-anatomic disturbance of peristalsis by an inhibiting influence through the nodal zones of

the myenterium, located in the œsophagogastric junction, the duodenojejunal area, the ileocaecal region, and the rectum. This demonstrated in the laboratory must be verified clinically.

2. Anatomic distortions, as kinks, adhesions, ptoses, etc., lead to stasis by disturbing the ganglia controlling peristalsis.

3. Hernia is a frequent manifestation of visceral displacement concomitant with stasis.

4. Long truss wearing with great pressure tends to produce rectal disease.

### GASTRO-INTESTINAL TRACT

**Terry, W. I., and Kilgore, A. R.: Congenital Stenosis of the Duodenum in an Adult.** *J. Am. M. Ass.*, 1916, lxxvi, 1774.

A man, aged 24, presented essentially negative family and past history and habits. His illness began at the age of 12, with a year of intermittent, rather indefinite pain in the lower abdomen, followed by three and a half years of freedom, and then four years more of similar attacks at intervals of from three to four weeks. The pain was always below the umbilicus, extending 5 cm. to either side of the midline without radiation. There was no definite relation to food. It was relieved by hot drinks and occasionally by defecation. It was usually worse at night.

He had had no definite pain for five years, but four years ago vomiting had begun and had grown progressively worse, usually coming after the evening meal, sometimes after other meals. There had never been hæmatemesis or melæna.

The abdomen was scaphoid except for a prominence about the umbilicus (distended stomach), over which there was marked peristalsis from left to right. The lower border of the stomach was seen and percussed midway between the umbilicus and the symphysis.

At operation the stomach was found to be much dilated and low in the abdomen. There were some old adhesions across both the anterior and the posterior aspects of the stomach toward the pyloric end, but none about the duodenum except two very thin strands between the pylorus and gall-bladder. The pyloric ring was much dilated. The first portion of the duodenum was dilated, the upper wall forming a definite pouch. Just distal to this dilated portion at about the junction of the first and second portions of the duodenum and above the entrance of the common duct, the intestine was evenly constricted to one-third or less of its normal diameter for about 1.5 cm. There was no thickening of the wall and no scars could be found and no abnormalities of the peritoneum to account for the constriction.

A posterior gastro-enterostomy was done, and when the stomach was cut into, marked thickening of the wall was noted in spite of the dilatation of the organ, indicating long-standing obstruction.

The patient vomited during the first forty-eight

hours following the operation, the vomitus containing considerable blood. Following this he was delirious much of the time and on this account was given occasional nasal feedings. On the fifth day he was apparently much improved and took considerable nourishment, but vomited small amounts twice during the afternoon. Quite suddenly in the evening the pulse-rate increased and respirations became shallow and rapid and he gradually sank into coma and died in six hours.

At necropsy there was found to be marked dilatation of the stomach, with partial breaking down of the gastro-enterostomy wound, leakage of stomach contents into the peritoneal cavity and beginning peritonitis. The constriction of the duodenum presented the appearance of an obstructing fold of the duodenal wall rather than of a narrow tube, 15 mm. long, as it had appeared before fixation. Grossly and microscopically the constriction was covered with normal mucous membrane and careful search failed to reveal any scar tissue or other evidence of old ulceration. EDWARD L. CORNELL.

**Cooke, J. V., Rodenbaugh, F. H., and Whipple, G. H.: Intestinal Obstructions; a Study of Non-coagulable Nitrogen of the Blood.** *J. Exp. Med.*, 1916, xxiii, 717.

This communication deals with analyses of the blood in intestinal obstruction, intestinal closed loops, and other acute intoxications. The tables give figures for non-coagulable nitrogen, urea nitrogen, and in some instances the total nitrogen partition in the blood. The authors' interest in this study of the blood was aroused by a communication of Tileston and Comfort, who, in a large series of human cases, reported three cases of intestinal obstruction with very high non-coagulable nitrogen. Since that time they have studied the blood of various animals which were being observed in connection with other experimental work.

They found that most cases of intestinal obstruction, especially with signs of acute intoxication, showed a high non-coagulable blood nitrogen, and it seemed to them that this factor might be of value in diagnosis and especially prognosis of acute abdominal conditions. They believe that this non-coagulable nitrogen determination is of value in various acute intoxications. If the reading is high, one may assume a dangerous grade of intoxication, but, on the contrary, one may not assume that a low reading gives evidence of slight intoxication, because a fatal outcome may be associated with a low reading. It is of considerable value to know that the non-coagulable nitrogen of the blood may show high readings in other conditions besides renal disease.

On the other hand, determinations of the blood urea alone are of somewhat less value in studying the retention products in the blood in these conditions. In their experimental animals the blood urea has varied from less than 30 per cent to more than 80 per cent of the total non-coagulable nitrogen, and,



while a high urea reading is the rule, the variations in the urea curve and the curves of the other non-coagulable nitrogenous substances are so great that the urea reading is a somewhat unreliable index of the extent to which non-coagulable nitrogenous substances have accumulated. The authors' work seems to establish the following facts:

1. Intestinal obstruction, as a rule, is associated with an increasing amount of non-coagulable nitrogen in the blood. With acute intoxication the rise in non-coagulable nitrogen may be rapid and reach as high as three or even ten times the normal amount. With more chronic intoxication there may be little or no rise in the blood non-coagulable nitrogen. Closed intestinal loops show exactly the same picture, and, when combined with obstruction, may give very high nitrogen readings.

2. Acute proteose intoxication due to injection of a pure proteose will show a prompt rise in blood non-coagulable nitrogen, even an increase of 100 per cent within three or four hours. These intoxications also show a high blood content of creatinin and urea. The residual or undetermined nitrogen may be very high.

3. A human case of intestinal obstruction with autopsy presents blood findings exactly similar to those observed in many animal experiments. Clinically the non-coagulable nitrogen of the blood may give information of value in intestinal obstruction. A high reading means a grave intoxication, but a low reading may be observed in some fatal cases and gives no assurance that a fatal intoxication may not supervene. The kidneys in practically all these experiments are normal in all respects.

It is possible that protein or tissue destruction rather than impaired eliminative function is responsible for the rise in non-coagulable nitrogen of the blood in these acute intoxications. Transfusions of dextrose solutions often benefit intestinal obstructions, and may depress the level of the non-coagulable nitrogen in the blood. Some cases show no change in non-coagulable nitrogen following transfusions and diuresis, and, as a rule, such cases present the most severe intoxication.

GEORGE E. BEILBY.

**Power, D.: A Clinical Lecture on Volvulus.** *Am. J. Surg.*, 1916, xxx, 178.

Power defines volvulus and states that the exact mechanism of its production is unknown, but that two necessary factors are: (1) congenital or acquired defect in the intestinal attachment, allowing free mobility, and (2) a condition producing an artificial pedicle. He cites seven cases from which he concludes that volvulus is one of the causes of acute intestinal obstruction and that it may appear in newborn children, although this is rare. He believes that volvulus requires for its production a loop of bowel, lying less securely packed than usual in the abdominal cavity, a loaded bowel, and irregular peristalsis. Frequently there is a twist of one, one and a half, or two turns in the loop upon itself; usually the mesentery is long in these cases.

The onset of volvulus is sudden and painful and occurs in persons who have had no reason to believe they were not in their ordinary health; it may occur without any known cause or it may follow an injury to the abdomen; generally the pain is persistent, or is characterized by exacerbation. The position of the volvulus determines the time of the appearance of the signs of intestinal obstruction. When the sigmoid is involved, the signs appear early; when the cæcum is twisted there may be a delay till the larger intestine has emptied itself, or it may be masked by a discharge of flatus generated in the great bowel. The onset of vomiting may be delayed or in some cases may be entirely absent, but usually it is a marked feature of the condition. At first the temperature and pulse are not altered.

Abdominal distention is limited early to the portion of bowel involved. In its incipency there is no rigidity of the abdominal walls; local tenderness over the actual seat of the volvulus is present, but is not very marked until the onset of peritonitis.

Strangulated hernia, acute perforation of the stomach or duodenum, biliary and renal colic, acute intestinal obstruction, due to strangulation by a band, hæmorrhagic pancreatitis, thrombosis and embolism of the mesenteric vessel, and appendicitis, must, each and all, be considered in the diagnosis.

The prognosis, at the present time, is extremely unfavorable; the improvement in this regard depends entirely upon the early recognition and early operation. In looking up the records in his hospital from 1899 to 1915, the author finds that there were 25 cases of volvulus, 14 men and 11 women. Twenty-one of these patients died.

In the after-treatment of volvulus, the author believes that nothing should be given by mouth for the first twelve hours after the operation, though the mouth may be rinsed out with warm water from time to time if thirst is distressing. Three or four doses of pituitary extract may be given hourly, by injecting 0.5 to 1 ccm. into the muscles, in the hope of causing contraction of the involuntary muscles of the body, thereby stimulating the unstriated muscles of the intestine. The rectal tube should be passed every four hours if the distention is very great.

In general, the after-treatment is directed toward the reduction in the tympanites, as he recognizes that the tympanites is a measure of intestinal paresis, and that as this is reduced the patient will improve.

EMIL C. ROBITSHEK.

**Abbott, A. W.: The Early Diagnosis of Intussusception in Children Under Three Years of Age.** *J. Lancet*, 1916, xxxvi, 319.

The author gives a series of statistical observations made upon twelve cases of intussusception in infants under three years of age. The diagnosis was made before operation in all but two and the intussusception was found to be ileocæcal in all cases.

In 100 per cent of the cases the attack began by a sudden violent abdominal pain, accompanied by re-



gurgitation of stomach contents; the child being otherwise well. This pain is recurrent, varies in intensity, but is regular in periodicity. With the pain the child assumes peculiar positions, generally prone. In 25 per cent of the cases, collapse quickly occurred and the pains were then merely indicated by moans and drawing up of the limbs.

In 92 per cent an abdominal tumor could be made out in the course of the colon.

In 91 per cent there were no faeces in the stools. In 83 per cent of these mucus was the chief constituent of the stools. In 77 per cent of the cases, blood was present in the stools only after the second day.

In nearly all cases the abdomen was not distended, flaccid, and scaphoid.

In exceptional cases vomiting was absent, and in 81 per cent of the series it only occurred after the second day.

Positive identification of the intussusception by rectal examination is pathognomic and was demonstrated in only 55 per cent of the cases.

The virulence of the disease and its mortality depend not so much upon the time elapsing before operation as upon the intensity of the strangulation of the mesenteric circulation. However, the earliest possible diagnosis and immediate operation is imperative.

In the series, 8 recovered and 4 died. In those in which collapse quickly followed the onset all died. While in those in which collapse was absent, 8 recovered and one died.

P. M. CHASE.

**Sweet, J. E., Peet, M. M., and Hendrix, B. M.: High Intestinal Stasis.** *Ann. Surg., Phila.*, 1916, lxiii, 720.

The authors carried out a series of experiments to determine the cause of death in high intestinal obstruction, the clinical picture of which suggests a grave constitutional disturbance of a toxic nature. Draper's idea that the toxin is a normal product of the duodenum which under normal conditions is neutralized or detoxified by the jejunum is supported. The authors began with the admitted clinical fact that the symptoms of acute pancreatitis and acute high obstruction are so much alike, if not identical, that a differential diagnosis can be made only at operation and this suggested that the lethal agent might in some way be connected with the pancreatic juice.

It is believed that high intestinal obstruction is due to the highly toxic properties that have been found in the proteose stage of protein digestion. The normal ferments of the stomach and the normal ferments of the pancreas break a protein down to this stage; normally it is supposed that the gastric digestion carries the proteins of the food to the peptone stage, from which the digestion is carried to the amino-acid stage by the ferments of the pancreas and the intestine. The intestinal juice is not supposed to contain any proteolytic ferment, except the ferment erepsin, which can digest the pro-

tein casein, but no others, while its chief function is to digest the proteoses to the amino-acids. But either gastric or pancreatic ferment is capable of producing a toxic proteose. In addition, many bacteria can digest the protein building-stones to the highly toxic amine compounds. Further, the substance lecithin can, by the action of the fat-splitting ferment lipase, be broken down with the formation of the choline bases, some of which, such as choline and neurine, are highly toxic.

Whipple has demonstrated that the toxic body found in their high loops is a proteose and that this purified proteose would exactly reproduce the symptoms of high obstruction when injected into a normal animal.

Two outstanding features of the authors' experimental work are: (1) the added demonstration of the fact that a gastro-enterostomy opening does not function in the presence of a normal pylorus; (2) the explanation of the similarity between acute pancreatitis and acute high obstruction; they are alike because they are both essentially the same thing, an intoxication with the toxic products of protein cleavage, in pancreatitis certainly due to the proteolytic ferment of the pancreas, in high obstruction not necessarily, perhaps, but in their opinion in all probability the same toxin, produced by the same ferment. In pancreatitis the escape of the products of the digestion of the pancreas into the tissue permits the intoxication; in obstruction the conditions of obstruction permit the absorption of toxic products, which under normal conditions would either not be formed, or if formed, would be immediately broken down to non-toxic products.

The authors refer to the failure to find any definite poisoning in conditions of stasis of the large intestine and draw attention to the fact that in ptosis of the colon the head of the pancreas is dragged across the transverse duodenum, producing as has been reported a dilated duodenum. Removal of the colon would relieve this drag and the authors predicate the idea that it would be well to consider the chronic absorption of such a poison.

C. G. HEYD.

**Fowler, R. H.: Complete Congenital Atresia of the Ileum.** *Med. Rec.*, 1916, lxxxix, 1039.

The author reports the case of a baby whose delivery was normal and easy, no forceps being used, the weight at birth being about seven pounds. Vomiting commenced about fifteen minutes after birth. The vomitus was green, flaky, and thick without special odor. The vomiting continued at intervals during the night and the following day. The abdomen was slightly distended and tense. There was no visible peristalsis, and no masses were seen or felt. There were no external congenital anomalies. The rectum easily admitted the little finger; no blood escaped or appeared on the gloved finger. No masses or obstruction were felt. The genitalia were normal.

At operation a right rectus incision was made.



A large amount of thin serous fluid escaped on opening the peritoneum. The small intestine presented. It was of dark color and distended six times the diameter of the neighboring loops. This distended loop of gut literally "popped" into the wound. It was blind and free, without fibrous cord connection. The mesentery down to its root was also lacking at this point. The gut above this point was less dilated than the blind pouch. The bladder was full, and the stomach distended. No stenosis or change in the pylorus was noted. The duodenum was dilated slightly more than the commencing jejunum. In a hurried search the lower end of the ileum was not found. The appendix was normal. There was no persistence of the embryonal type of cæcum. The latter was firmly attached to the posterior abdominal wall. The intestines were moderately congested. The upper free end of the small intestine was sutured to the abdominal wall and the abdominal wall closed in layers about the protruding gut. Enterostomy was then performed by the thermocautery. The patient died five days later.

At autopsy it was found that the total length of the small intestine was 56 inches. The ileum ended in a small blind pouch 22.5 inches from the ileo-cæcal valve, one-half inch in diameter. The wall of this was thickened and bulbous for a distance of three-eighths of an inch. It was slightly curled upon itself. The segment distal to this cul-de-sac was patent. There was a defect in the mesentery at a point opposite the atresia of the ileum. The upper blind pouch ended at a point 33.5 inches from the pylorus. It was very much dilated for a distance of six inches. The widest diameter of this portion was 1.75 inches. The duodenum had no mesentery, the cæcum was located in the right iliac fossa, therefore rotation of the intestine had occurred. The ileo-cæcal valve and the pyloric sphincter showed no change. The liver, gall-bladder and ducts, and stomach were apparently normal. There was an accessory spleen.

EDWARD L. CORNELL.

**Huggins, R. R.: Absence of Muscular Tone an Important Etiological Factor in Post-operative Ileus.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

Distention and stasis, to a varying degree, follow most laparotomies. This is usually considered a temporary paralysis, a reflex action through the plexus of Auerbach and Meissner, as a result of manipulation and trauma to the visceral peritoneum. Aside from the paralysis accompanying peritonitis, there are occasional cases where infection can be excluded, in which the patients die from paralytic ileus. This may occur when least expected and where there has been very little intra-abdominal exposure and manipulation. The comparative frequency with which it has occurred with vaginal hysterectomy is significant, because there is very little exposure and handling of intestines in this procedure. Careful pre-operative, operative, and

post-operative treatment is important in lessening post-operative paresis, but occasionally, in spite of this an aggravated form of the above condition occurs and death ensues after exhaustion of all known methods of relief. When there is evidence of chronic fatigue with poor muscle tone, after chronic infection or long continued strain, there is always greater difficulty in dealing with this post-operative distention. The author believes that, in certain instances, where death occurs from so-called paralytic ileus, it is primarily due to lack of muscular strength in the walls of the stomach and intestines. As a result of observation of various degrees of distention in routine abdominal surgery, we find that this depends largely on the general muscular tone in the individual previous to operation, and the amount of exhaustion incident to the operative procedure and the effects of the anæsthetic.

Keith has recently called attention to the presence of nodal tissue in the bowel, similar to that in the heart. This is located at various points in the intestinal tract and acts as pacemaker for that particular portion. It is neuromuscular in character and suggests the intimate relation that exists between the muscular and nervous system, and the disturbances that may arise, if either is below the normal in efficiency. A block may occur, as in the heart, at any point where one rhythmical zone passes into another. Bayliss and Starling demonstrated the intrinsic beat in intestinal muscle. Magnus demonstrated that the strips beat more actively when removed from a normally fed animal, than from one that was not digesting. The intestinal tract has an intrinsic tone, regulated by extrinsic nerves. Tonic contraction and rhythmical peristalsis disappear when there is general bodily weakness, and when the depleted central nervous system fails to deliver the necessary tonic impulses. Post-operative distention varies in direct proportion to the strength and tone of the general muscular system. Patients with poor general muscular tone require more careful preparation, and greater efforts to minimize exhaustion from anæsthetic and operative effects.

**Moschcowitz, E.: The Pathological Diagnosis of Diseases of the Appendix.** *Ann. Surg.*, Phila., 1916, lxiii, 697.

Moschowitz believes that in 90 per cent of cases the diagnosis of a present or previous appendicitis may be easily recognized by the naked eye. He holds that the conventional method of longitudinally slitting the organ to see if the appendix is diseased and to what extent is wrong. In acute appendicitis the longitudinal method is not so apt to lead to mistakes. The author advises simple transverse incisions made at various levels. By such incisions it is possible to tell accurately the quantity and topography of the exudate; the width and conformation of the lumen and the evidence of a lumen; the relation of the mucosa to the muscularis. Emphasis is placed upon the observation that a local peri-



tonitis is always present in the early stages of disease, and that the absence, even grossly, of a localized appendicular peritonitis practically excludes an acute appendicitis. Acute perforations are, in the opinion of the author, due to the direct destructive action of the bacteria upon the wall of the appendix associated with extensive tension upon the exudate within the lumen. Thrombosis of the mesenterium plays a small part in the etiology of perforations.

The pathological anatomy of acute appendicitis is summarized as follows: (1) The infection is always enterogenic as evidenced by the invariable origin of the lesion from the mucosa. (2) The lesion of acute appendicitis is not a catarrhal inflammation as understood in the pathological sense. (3) The infection starts in the crypts of the mucous membrane. Additional weight is lent to this contention by the fact that approximately nine-tenths of the lesions of acute appendicitis occur at the tip of the appendix where stagnation is most apt to occur. This fact makes untenable the contention that appendicitis is occasionally due to a cæcitis or lesions of the so-called Gerlach's valve by interfering with the drainage of the organ. (4) The pathological lesion fairly corresponds to the duration of the illness. (5) The essential pathological lesion of acute appendicitis is a membranous inflammation, a so-called diphtheritic inflammation.

In healing appendicitis the course of events is as follows: The exudate or membrane breaks down, becomes necrotic, and leaves an ulcer which gives birth to granulation tissue. The extent of this granulation tissue depends upon the extent of the destruction of the mucosa. If the mucosa has been completely destroyed, no regeneration of epithelium is possible and the ensuing organization of the tissue results in complete obliteration. If the mucosa has not been completely destroyed, the epithelial lumen is restored, a stricture is formed, the size of which is obviously in inverse ratio to the extent of the mucosal destruction. At the same time, the formation of new connective tissue in the muscular coats leads to two changes: deformity, and separation of the fibers by newly-formed connective tissue. In the peritoneal coat the formation of the new connective tissue and destruction of the surface epithelium also lead to two changes: thickening, and formation of adhesions. The histological characteristics of a healed or chronic appendicitis are therefore the following: (1) a narrow lumen (stricture); (2) complete obliteration of the lumen by new connective tissue; (3) the absence of mucosal crypts. (This absence indicates, except in cases where the lumen of the appendix has been dilated from other causes, that a precious acute suppurative inflammation has taken place. This phenomenon is important in differential diagnosis, in cases where there is a question as to whether the lumen of the appendix is narrower than normal.); (4) the widening of the submucous connective-tissue zone; (5) the attenuation and diminution (or even complete disappearance) of the lymphoid tissue; (6) the infiltration of

the muscular coats by new connective tissue, and consequent deformity; (7) the thickening, increased density, and deformity of the peritoneal coat.

As a result of the author's observations it is stated that an acute appendicitis always gives rise to permanent pathological changes and, secondly, that a normal appendix never has been the seat of an acute attack. Of the diagnostic characters of healed or chronic appendicitis great emphasis is laid upon (1) stricture, (2) obliteration, (3) disappearance of crypts, (4) widening of submucosa. The appearance of petechial spots scattered throughout the mucosa is considered to be due to operative trauma. Diverticulum of the appendix has always been associated with acute inflammation.

In regard to carcinoma of the appendix the author calls attention to certain curious features of the disease. Carcinoma of the appendix differs from carcinoma of other organs and especially of the intestinal tract, in a number of features: (1) It occurs as a rule in much younger individuals, most commonly in the second and third decades. Two of the author's cases exemplify this. (2) Carcinomata of the appendix, both pathologically and clinically, are of a very low grade of malignancy. Appendix carcinomata resemble other carcinomata only in their alveolar structure and the epithelial type of cell. In other respects, they differ histologically from other carcinomata. The cells are smaller and less atypical; the nuclei show little variation in size and shape, are less rich in chromatin, and comparatively free from mitotic figures. Finally, there is less tendency to invasion of neighboring organic structures, and practically no tendency to metastasis. Indeed, the author finds these pathological data brought out by clinical experience. Carcinoma of the appendix has by far the best prognosis of any cancer in the human frame. The author believes the reports of fatal cases are rare. Perhaps one of the reasons for the favorable prognosis is the early diagnosis of appendicular pain, due to the prompt interference with the drainage of the narrow lumen of the organ by the growth of the tumor. (3) The vast majority of carcinomata of the appendix are of the solid type, whereas carcinomata of the intestine are of the glandular type.

After a consideration of the subject as a whole the author arrives at the following conclusions:

1. The pathological lesion of acute appendicitis represents a suppurative process from the very beginning. The earliest lesion is as pathognomonic as the primary lesion of syphilis, and all the subsequent stages of the disease within the organ are directly traceable to the spread and development of this lesion. There is no pathological evidence that an "acute catarrhal" inflammation of the appendix occurs.

2. The changes associated under the name "chronic" appendicitis (stricture, obliteration, etc.) are pathogenetically the healed products of the acute lesion. According to this interpretation, chronic appendicitis is not a continuous progressive



inflammation, but an end-product. There is no pathological evidence of "involution" of the appendix, or of "chronic catarrhal" inflammation of the appendix.

3. The only justifiable classification of inflammation of the appendix, therefore, is the following: (1) Acute appendicitis. (2) Healing of subacute appendicitis. (3) Healed or chronic appendicitis. (4) An acute localized peritonitis with the formation of fibrin and limited to the site of the lesion is always present in acute appendicitis as early as twelve hours after the onset (and perhaps earlier), so that the absence grossly of a localized peritonitis, in suspected cases, is *eo ipso* evidence of absence of acute appendicitis. (5) In addition to obliteration and stricture, attention is called to two new, easily recognizable, constant, and pathognomonic signs of chronic appendicitis; namely, (a) absence of mucosal crypts; (b) marked widening of the submucous connective-tissue zone. The latter sign is especially easy to determine upon cross-section of the organ, and is recommended as the simplest way to determine the presence or absence of a chronic appendicitis. (6) Cross-section of the appendix at various levels is far preferable to longitudinal section, to determine pathological changes.

C. G. HEYD.

**Valdez, G.: Morphine as an Early Diagnostic Element in Certain Forms of Acute Appendicitis** (La morfina como elemento de diagnóstico precoz en ciertas formas de apendicitis aguda). *Prensa méd.*, Argent., 1916, ii, 430.

Valdez uses morphine in the diagnosis of various acute abdominal processes, especially in those of an appendicular nature, believing that this method may be applied in those cases in which the diagnosis is doubtful. In effect, by making an injection of morphine in such cases the reflex defensive phenomena disappear (contracture of the abdominal muscles) which allows a much better abdominal examination, as at the end of an hour after the injection the pain can be localized with great exactness.

Valdez thinks that morphine can be usefully employed in some cases of difficult diagnosis.

W. A. BRENNAN.

**Robinson, J. E.: The Leucocyte Count of Appendicitis.** *N. Y. M. J.*, 1916, cii, 1173.

A report is given of 200 appendices removed at operation at the King's Daughters' Hospital, Temple, Texas, in the last two years, in which sections were made of the appendices and records made of the blood-counts, only blood-counts made before operation being considered.

Reports are also given of the blood-counts in 200 cases in which records were kept of the blood-counts, but no sections made of the appendix.

Fifty-two cases, or 21 per cent, were diagnosed as active inflammatory by both the surgeon and the pathologist, the average leucocyte count being 18,000 and the polymorphonuclears 82.8 per cent.

Sixty-five cases, or 32.5 per cent, were diagnosed as chronic by both the surgeon and the pathologist, the average leucocyte count being 10,161 and the polymorphonuclears 76 per cent.

In 40 cases, or 20 per cent, the appendices were removed while operations were being performed for non-inflammatory conditions in the abdomen. In these cases, which both the surgeon and the pathologist reported normal, the average leucocyte count was 8,400 and polymorphonuclears 67.5 per cent.

It will be seen that the surgeon's report made with the history and appendix before him corresponded with the laboratory report 157 times or in 78.5 per cent of the cases.

Fourteen cases were diagnosed as active appendicitis by the surgeon and as normal by the pathologist, and in these cases the average leucocyte count was 11,900 and polymorphonuclears 72.1 per cent.

Twenty-four cases diagnosed as chronic appendicitis by the surgeon and as normal by the pathologist gave an average leucocyte count of 8,000 and a polymorphonuclear of 65.8 per cent.

In 5 cases reported as active appendicitis by the surgeon and as chronic by the pathologist, the average leucocyte count was 7,450 and the polymorphonuclears 62.5 per cent.

Presuming that the findings are correct and that the work is that of surgeons of average ability, it will be seen that the surgeon is incorrect in his conception of the pathology of the appendix in 21.5 per cent of the cases. Twelve per cent of the normal appendices were diagnosed as chronically inflamed. Seven per cent of chronic cases were diagnosed as active, and 2.5 per cent of normal appendices were diagnosed as acutely inflamed. There is one redeeming feature of the surgeon's report; in no instance was an inflamed appendix diagnosed as normal, and his efficiency along this line is easily 100 per cent.

In the second series of 200 cases, in which sections were not made, 93 were diagnosed as actively inflamed and 55 showed pus either in or around the appendix; these gave an average leucocyte count of 29,000 and a polymorphonuclear of 84.6 per cent. The highest leucocyte count was 98,000 with 83 per cent polymorphonuclears. The lowest count was 10,000 leucocyte with 86 per cent polymorphonuclears.

Thirty-eight cases diagnosed as active appendicitis showing no pus gave an average leucocyte count of 18,000, polymorphonuclears 83.2 per cent.

Six cases in this series gave a leucocyte count as low as 12,000 with an average of 83 per cent polymorphonuclears. In 107 cases diagnosed as chronic appendicitis the average leucocyte count was 10,000, polymorphonuclears 70.2 per cent.

It will be noticed here that the cases showing pus gave a leucocyte count of 11,000 and a polymorphonuclear count of 1.8 per cent higher than those in the series which were sectioned and pronounced to be actively inflamed, while the cases showing no pus gave practically the same count as the series



sectioned, namely, 18,000 in the sectioned series and 18,500 in the series not sectioned, with a difference of only 0.4 per cent in the polymorphonuclears.

EDWARD L. CORNELL.

**Leigh, S.: Treatment of Suppurative Appendicitis.**

*South. M. J.*, 1916, ix, 523.

As soon as appendicitis is suspected, the head of the patient should be immediately elevated and the patient kept on the right side. In such position, if rupture takes place, the septic fluids will either remain at the site of the appendix and become walled off or gravitate into the pelvis where they may be more safely taken care of by the serous membrane, be more conveniently reached at the time of operation, and the dangerous region of the upper abdomen will be thus safeguarded.

The question of transportation is most important, the patient's shoulders being well propped up and inclined to the right side. This must be strictly done in all carriages, wagons, trains, and ambulances used for the sick. The last named should always be equipped with an elevating stretcher.

When a case of suspected suppurative appendicitis reaches the hospital, he should be immediately placed on an elevated bed, on the right side, with an ice-bag applied. Except in desperate cases, a low turpentine enema should be given.

The anæsthetic is of major importance. The author has used nitrous oxide-oxygen in 2,900 cases, not only without mortality, but without any bad effects, either direct or indirect. It is especially helpful in severe appendicitis, adding practically nothing to the shock, producing no irritation of the lungs or kidneys, and accompanied either by no nausea or a minimum amount.

The location of the incision in cases of suspected suppurative appendicitis is important. Drainage through the old longitudinal incision leaves a very weak spot, which nearly always requires operation to close. For several years the author has employed the "transverse incision." The abscess is opened after walling off. The pus is drained and the appendix sought in most cases. The cavity is wiped dry and gauze rubber tube drains inserted.

In suppurative appendicitis, in which the abscess has not been walled off by adhesions, and in consequence of the general peritoneal cavity has become infected, the transverse incision must be stretched to allow free access to the peritoneal cavity. Incisions are preceded by injecting novocaine solution to produce "nerve-blocking." The greatest possible gentleness is exercised in the handling of the tissues.

No irrigation should be used, but the pus should be wiped out carefully with sponges. After all the pus which is accessible is thus cleaned out, pads are cautiously inserted and the appendix searched for and removed, a pad being packed into the site of the appendix, which is usually quite soiled. The pelvis is often found full of pus, which should be removed by suction.

EDWARD L. CORNELL.

**Shaw, H. A.: The Treatment of the Retrocæcal Appendix.** *Ann. Surg.*, Phila., 1916, lxiii, 715.

The author refers to the simple, clean, bloodless technique for the removal of retrocæcal appendix by mobilization of the cæcum and colon. In the etiology of a retrocæcal appendix the following factors are emphasized: (1) the influence of peritoneal adhesions established during the descent of the cæcum from its subhepatic position to the iliac fossa; (2) the inherent curve of the fecal pouch; (3) the unequal development of the pouch.

The author suggests the diagnostic points necessary to determine the position of aberrant appendices: careful survey of the cæcum (with the embryology thereof in mind), noting the relative size and position of the terminal sacculi, its topographical peritoneal relations, careful palpation. The technique emphasizes the mobilization of the cæcum and portion of the colon necessary for exposure; and after exposure separation of adhesions and delivery of the appendix. After removal of the appendix the cæcum is replaced and the incision line in the parietal peritoneum closed by sutures. The stump of the appendix is treated after the accepted manner.

C. G. HEYD.

**Frazier, C. H., and Peet, M. M.: Experimental Colonic Stasis.** *Ann. Surg.*, Phila., 1916, lxiii, 729.

The authors believed that a maximum amount of stasis without partial obstruction could be secured by a simple reversal of the large intestine and carried out their experiments by the reversal of the colon for a length of four to six inches above the sigmoid. Two sets of experiments were carried out, as follows:

1. With reversals of the colon *per se* the stools were soft and well formed and all the dogs gained weight. The following substances were demonstrated by qualitative tests in the urine: methylamine, trimethylamine, tetramethyldiamine, pentamethyldiamine, paroxyphenylethylamine. From the presence of the last, it was inferred that phenylethylamine was present. Methylguanidine, diamethylguanidine, and imidazoylethylamine were not demonstrable. The urine of these dogs as well as the substances obtained after chemical isolation of the mixed bases was injected intravenously, but no noticeable toxicity could be established nor did the curve of blood-pressure differ from that to be noted following the injection of normal canine urine.

2. The results of reversal of the colon in dogs with Eck's fistula: A heavy silk ligature was tied around the portal vein close to its entrance into the liver, thus forcing all of the portal circulation into the vena cava. In these experiments the stools were well formed and no toxic symptoms were observed. The chemical examination of the urine was the same as before, both qualitatively and quantitatively, showing that the liver had not removed or changed the substance absorbed from the colon.

The authors' conclusions were that mere stagnation of fæces in the colon of the dog, when on a nor-



mal mixed diet, does not lead to the formation of toxic substances of note, at least in the presence of the normal flora of the canine colon.

The fact that these dogs remained in perfect health and gained in weight indicates that simple colonic stasis in the dog is harmless and certainly suggests that the dire effects attributed to colonic stasis in man are, in part at least, due to some other cause than the absorption of the products usually formed in simple faecal stagnation. C. G. HEYD.

**McArdle, J. S.: Alternatives to the Operation of Colotomy.** *Practitioner*, Lond., 1916, xcvi, 578.

The after-effects of so unsurgical an operation as colotomy are very distressing to the patient. The author believes that every effort should be made to substitute some more finished procedure for this crude method, and suggests that either of the four following operations should be carried out, according to the conditions found on exploration:

1. The sigmoid above the stricture can be joined to the sound lower part of the rectum.
2. If the sigmoid is fixed so that it cannot be brought down, the transverse colon, if low, may be anastomosed to the rectum and to the descending colon above the stricture.
3. If this is not feasible, the cæcum may be joined to the rectum and the ileum joined to the colon above the stricture.
4. The lowermost coil of the ileum may be joined to the rectum and by a lateral anastomosis to the descending colon above the obstruction.

The difficulty in all these procedures is the application of the usual suture methods, because of the difficulty in commanding the rectum through an abdominal incision.

The author has devised a means whereby these operations are rendered comparatively easy. In whatever segment the upper opening is made, the small female end of a Hildebrand button is inserted and fixed with a purse-string suture. By means of an especially devised forceps the larger male end is passed through the rectum and made to project upward, so that a small incision may be made over the central part, which then protrudes, allowing the bowel wall to slide down so close to the spring that no suture is needed. The two halves of the button are then clamped. The result is a passage for faecal matter into the rectum instead of outward on the abdomen or through the lumbar region, while drainage of the large intestine is possible through this route. E. K. ARMSTRONG.

**Axtell, W. H.: Acute Angulation and Flexure of the Sigmoid, a Causative Factor in Epilepsy.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

In December, 1910, the author published his first list of 31 cases, 8 private and 23 asylum cases. In August, 1911, a further report was made on 10 private cases with 3 recoveries, this included 3 additional asylum and 2 private cases, making in all 36 cases. The 3 reported cured have remained so

for a period of over four years. One additional case of the original list of 10 private cases has had no return of the convulsions since ceasing treatment two years ago. The treatment seemed at the time to increase the irritation as reported.

Since the last report, Axtell has had 9 additional cases with 4 of them remaining free from seizures for from one to two and a half years, making in all 45 cases reported with 8 recoveries to date.

From his observations the author is convinced that those who acquire epilepsy after the fifteenth year are more amenable to successful treatment than when the trouble commences earlier in life. In his judgment surgery can give but little relief except where there is a definite history of inflammatory adhesions holding the angulations and flexures; in fact the condition of faecal stasis precludes surgery of the colon until the condition is first relieved, which when so relieved eliminates a prime factor in the production of the trouble. A new and undescribed cause of the intestinal ptosis which is so generally present in these cases is the separation of the recti muscles, which are so essential to a thorough evacuation of the colon and for the support of the abdominal organs.

The essential failure of treatment of these conditions lies in the fact that so few recognize the true condition, and, if the condition is recognized, there is not sufficient persistence in relieving the condition, or an ignorance as to the amount of material the colon holds and as to when it is well emptied. As the result of failure to recognize the true condition, mutilating surgery is resorted to without getting results commensurate to the gravity of the surgery resorted to, the first intimation of the true condition being found upon opening the abdomen; then details are carried out which should have been used in the first instance and which would have rendered surgery unnecessary.

**Hawley, D. C.: Position for Sigmoidoscopic Work.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

A majority of writers express a preference for the knee-chest position, while a minority prefer some other, such as the Hanes, Sims, or the exaggerated lithotomy position.

Before the days of the pneumatic sigmoidoscope the position was of necessity such as would admit of inflation by atmospheric pressure. Here the knee-chest position was undoubtedly the most satisfactory.

The knee-chest position is trying and disagreeable for the patient and not easy nor always convenient for the operator. Its use is frequently attended with embarrassment and fear on the part of the patient.

With the pneumatic tube the older method may be discarded. The author favors the following method:

The patient is placed in the left lateral prone position with the left arm drawn out behind the back, the patient lying well over on the left chest and

stomach, the knees flexed, the right more than the left and placed above and well over and beyond the left on the table and with the back concaved as much as possible. In this position the abdominal muscles are relaxed, while in the knee-chest position they are apt to be contracted. In a majority of cases the instrument may be passed easily and quickly over the brim of the pelvis and into the sigmoid colon as far as required or to its full length.

This method is not advocated exclusively, but a more thorough trial is urged.

**Hanes, G. S.: Some Important Pathological Conditions About the Rectal Outlet.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

Tubercular ulcerations do not occur as frequently in the mucosa of the rectum and sigmoid as is generally believed. Amœbic and various types of bacterial ulceration produce dysenteric symptoms that often lead to emaciation and exhaustion. Active tubercular ulceration is always accompanied by a decided increase in the temperature and pulse-rate. These are not characteristics in other types of ulceration. In tubercular ulceration there is a history of constant and progressive symptoms while in amœbic there is usually a history of improvement and relapses. Tubercular ulceration involving the rectum and sigmoid seldom yield to treatment. Amœbic ulceration in this climate can be cured by one method or another.

Bacterial types of ulceration are usually very difficult to treat. Within the last two years Hanes has found cauterization with the high-tension electric spark to be a most valuable means of treatment.

Tubercular abscesses often occur about the rectum when patients otherwise show no evidence of tuberculosis. The abscesses and subsequent fistulæ are characteristic in that there is a great tendency to undermining of the skin. The external openings are, therefore, large with a livid appearance of the surrounding cutaneous structures. They point to impending trouble which may be precipitated months or years hence. This being true it is of great importance that we direct the habits, hygiene, etc., of individuals thus afflicted.

Fistulæ of long standing with one or more very small external openings with a history of an extensive abscess are very difficult to cure. From external evidences they appear to be very simple. Usually the finger when introduced well into the rectum will be able to detect by careful palpation the hard indurated sinuses which often extend surprisingly high up by the rectum.

Internal fistulous openings rarely, if ever, perforate the rectal wall unless there is some pathology primarily in the rectal mucosa whereby its resistance is impaired. The internal openings of the fistulæ are usually in the anal canal. The anal tissues are almost always diseased before the abscess is formed, therefore it is reasonable to suppose that the infection passes out through the diseased anal structures and is responsible for the abscess.

There are occasional fistulous tracts that extend up by the rectum to considerable heights and are very tortuous. It is difficult to follow these sinuses to their terminations when operating. When the wound heals and a small opening remains it is fairly certain that some part of the original fistula was not reached. It is then advisable to inject bismuth paste which will often effect a cure.

Pruritus ani is undoubtedly a local infection. The focus of the disease is below the pectinate line and at the anal margin. It has been the author's practice to remove the diseased tissues at the margin of the anus and from the emulsion of these diseased structures bacteria are cultivated and an autogenous vaccine administered to the patient. The operation with autogenous vaccine obtained in this manner gives decidedly the best results.

**Krouse, L. J.: Spasmodic Stricture of the Rectum.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

Spasmodic stricture of the rectum is often called phantom stricture on account of its imaginary existence. Krouse states that in the early part of the last century it was more frequently diagnosed than later on. At the present time the opinion regarding the existence of such an affection is equally divided between those who are firm believers and those who doubt its existence.

After quoting the statements of various authors well versed in rectal pathology, he expresses his own opinion as to its existence and reports several cases. He agrees with a few writers who believe that spasmodic stricture is often the forerunner of the more serious disease of benign stricture of the rectum. He reports several cases.

Krouse claims that spasmodic stricture is not a disease but only a symptom of some other disease located in the rectum or in an adjoining organ. His conclusions are:

1. It is not a common affection.
2. It is easily detected on digital examination.
3. It often terminates in an annular fibrous stricture.
4. It involves the lower Houston valve.
5. A rectal ulcer is the most important etiological factor.
6. Curing the ulcer in its early stage lessens the chances of the development of an annular fibrous stricture.

Syphilis, regarded as a contagious disease as other exanthemata, is characterized by its chronicity and virulence. The only exception to its point of inoculation being confined to tissues covered by squamous epithelium, is within the rectum.

Its frequency in the rectum and anus is not realized and, consequently, is not recognized by the profession. Its relationship to fistulæ and stricture is emphasized, and the importance of tuberculosis in these two conditions minimized. The successful treatment of fistulæ is proverbial. The possibility of stricture resulting from secondaries later in life is suggested.



**Drueck, C. J.: How to Examine the Rectum.**  
*Chicago M. Recorder*, 1916, xxxviii, 280.

A very careful clinical history should precede all examinations. The author includes an outline which he has found serviceable and which allows for a detailed history.

The examination comprises inspection, digital and instrumental examination.

Inspection reveals many points which might otherwise escape notice. Digital examination is the most important of all and should not be painful when properly executed. A careful method should be followed in making the digital examination so that no false interpretation may result.

Instrumental examination is made by bougies and specula. The former are dangerous to use and are not recommended. An ordinary bivalve speculum is usually satisfactory for an examination of the lower part of the rectum. A long, conical speculum with an artificial light gives the best results in the examination of the upper rectum and sigmoid.

J. H. SKILES.

**Yeomans, F. C.: Malignant Transformation of Benign Growths.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

The benign tumors of the colon and rectum considered were of the polypoid type: solitary polyp, multiple polyposis, multiple adenomata, and villous tumor. All originate from the intestinal mucosa, are of the same histologic structure but differ in number, size, form, and the relative amounts of glandular and fibrous tissue present.

The author cites the theories of origin of multiple adenomata as advanced by Meyer, Liebert and Schwab and G. Hauser and H. C. Ross's views on the formation of benign growths. Yeomans thinks these tumors inflammatory in character and notes the frequent history of colitis or dysentery in these cases, intestinal parasites as causal in others, and the positive evidence of the rôle of irritation as furnished by therapy—colonic lavage, or colostomy and irrigation benefiting some patients and curing others. He reports a case of multiple adenomata in a man, aged 30, colostomized in 1913, with marked benefit. Many tumors have disappeared, the remainder have retrogressed and the patient is working. There is no evidence of malignant change.

That benign growths become malignant is beyond question, but the cause involves the same enigma as the cause of cancer itself. The author cites the work on neoplasms of Waldeyer, Adami, Cathcart, and others, as well as modern research on the transplantation of tumors and the parasitic theory of their origin. He concludes: "All that can be stated positively is that cancer begins as a small local process; that it excites no reaction in the blood whereby a diagnosis can be made; that the individual cancer-cell is the parasite of cancer, and whatever eventually explains the origin of cancer will also explain the transformation of a benign into a malignant growth."

Yeomans reports the transformation of a simple adenoma into an adenocarcinoma in a man, aged 76, who had rectal bleeding of 8 years' duration, progressive constipation, and a tumor that in recent years could not be reduced within the rectum. The tumor, 3.5 by 2 inches, was attached just within the anal verge. It was removed under local anæsthesia and both clinically and histologically was proved to be adenocarcinoma.

Villous tumor or adenoma tends to recur in malignant form so should be extirpated early, thoroughly, and radically.

Multiple adenomata constitute the most important and serious type of benign growth of the intestine. Their usual site is the lower colon and rectum. Clinically they are malignant from diarrhœa, hæmorrhage, etc., and if neglected over 40 per cent become actually malignant. Improper local treatment, as snaring, curettage, and cauterization is followed by malignant recurrence in a large proportion of cases.

The curative, operative procedure indicated is enterotomy, either in the colon above the growths, or in the terminal ileum when the entire colon is affected. If the tumors disappear, the enterotomy may be closed. If they persist, after prolonged irrigation and the patient's general condition warrants it, partial or total colectomy is indicated with implantation of the ileum low down into the sigmoid, the operation being performed either in one or, preferably, two stages.

**Gaut, S. G.: Anorectal Injuries.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

While the rectum is protected by the buttocks and bony structures, it is frequently injured by external trauma, expulsion of hardened feces, and by foreign bodies, swallowed or introduced through the anus, such wounds being contused, lacerated, incised, or perforated.

Laceration of one or all of the rectal coats results from careless examinations, introduction of imperfect syringe nozzles, bougies, proctoscopes, or other instruments.

Perforating wounds are caused by bullets, knife thrusts, and pointed objects that have been swallowed or introduced into the rectum, except when due to specific ulcers or cancer.

Recently many pneumatic rectal ruptures, the result of compressed air introduced through the anus in a spirit of fun, have been reported.

The injection of carbolic acid into hæmorrhoids is responsible for extensive anorectal injuries.

The chief manifestations of superficial anorectal injuries are: bleeding, sphincter algia, frequent micturition, and painful defecation; symptoms that are exaggerated when the wounds are extensive.

Infected wounds are characterized by a chill, temperature, throbbing pain, swelling, and a thick yellow discharge.

In extensive injuries of the upper rectum, hæmorrhage is profuse. There is shock, the patient col-

lapses, and soon exhibits symptoms of peritonitis, when the peritoneum is involved.

The diagnosis of anorectal injuries is easy when the nature of the accident is known, the degree of hæmorrhage, bruising, and swelling noted, and the buttocks, anus, and rectum inspected and digitally and proctoscopically examined.

As to the treatment, minor injuries take care of themselves, while extensive injuries may require simple or complicated treatment.

Incised wounds are sutured under aseptic conditions.

Contused, lacerated, and pneumatic injuries are drained at one or more points, following irrigation, and the ragged edges and necrotic tissue removed. Subsequently they are treated by drainage and topical applications, as fistula wounds.

Injuries of the bladder and urethra are immediately closed when feasible, but if not the bladder is drained, and the wounds here and in the rectum are permitted to heal by granulation.

Small rectovesical rents are sutured, but where the rectum or sigmoid is extensively injured, the bowel is resected, or an artificial anus is established.

Rectovaginal tears are repaired by suturing the vaginal before the rectal side of the wound is closed.

**Barnes, R. H.: Observation on Fissure in Ano.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

The author considers fissure as an ulcer and believes that traumatic causes are not true etiological factors in the production of this trouble but that it is necessary that the tissues become inflamed and hence frail and easily torn in order that fissure be formed. He believes that catarrhal inflammatory conditions are frequently the result of an excessive carbohydrate diet and sometimes an excessive fat diet.

In the treatment of fissure he recommends palliative treatment by correcting the diet with reference to the excesses of carbohydrates and fats and placing the patient on a proteid diet for a time. When operation is necessary, he believes that the object should be drainage rather than paralyzing the muscular fibers. He also advocates the use of a small enema before defecation in order to avoid irritation from the stool. It is very important to keep the wound clean by hot sitz baths and the hot enema, in order that any foreign substance may not lodge in the wound.

**Hill, T. C.: Prolapsus Ani in Adults.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

The theory is advanced that all cases of procidentia recti are the result of neglect or improper treatment of what was in the beginning a simple form of mucous membrane prolapse. Correction of the condition early may prevent serious infirmity later in life.

He describes at length an operation modified after that of Goodsall of London. In this opera-

tion he employs a multiple suture. He advises removing the excess of tissue distal to the ligature.

The operation is performed under local anesthesia and is advised for patients of all ages. It is particularly suitable for use in prolapse of the aged.

The author claims that the operation is painless, short, and easily performed. There is absence of hæmorrhage and the end-results are satisfactory.

**Terrell, E. H.: The Treatment of Hæmorrhoids by a New Method.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

The author presents a simple, safe, and efficient method of curing selected cases of hæmorrhoids by the injection of quinine and urea solution. During the past two years 127 patients have been treated by this method with only one recognized failure. Injection of quinine and urea in solutions of from 5 to 20 per cent strength produces starvation and atrophy of the hæmorrhoids. The series reported includes only uncomplicated internal hæmorrhoids. The results of the treatment of these patients justify the author's conclusion that the method is simple, safe, and effective in properly selected cases.

#### LIVER, PANCREAS, AND SPLEEN

**Einhorn, M.: The Duodenal Tube as a Factor in the Diagnosis and Treatment of Gall-Bladder Disease.** *J. Am. M. Ass.*, 1916, lxvi, 1908.

The duodenal tube has made possible the obtaining of secretions direct from the papilla of Vater and the instilling of fluids in its vicinity. Einhorn has diagnosed probable cholecystitis by direct examination of the bile in forty cases. He concludes that in the majority of cases in which turbid bile is found in the duodenum in the fasting condition, cholecystitis with gall-stones exists. Turbid bile is occasionally found without gall-bladder disease, when the liver is seriously involved (neoplasms, or echinococcus, or cirrhosis), or in stricture of the duodenum below the papilla. Exceptionally, clear bile is associated with biliary calculi, either the gall-bladder not being inflamed, regardless of the presence of stones, or the gall-bladder is entirely filled with calculi, no bile entering the organ.

The macroscopic appearance of the bile is important, a clear yellow bile denoting a normal function of the liver and gall-bladder, while a turbid, greenish, or dark brown bile usually means a diseased state of one or both of these organs.

In a number of cases of cholecystitis an attempt was made to instill either a weak solution of argyrol or of ichthyol just above the ampulla. This treatment is based on the idea that astringents will exert a beneficial effect on the bile-ducts. Infections of 20 to 30 ccm. of a 0.25 per cent solution of argyrol may be given every other day. The improvement is often striking, benefiting not only the digestive disorders but the gall-bladder condition. The author believes that duodenal alimentation finds an appro-



prate place in some forms of cholecystitis, particularly when complicated with ulcers of the stomach or duodenum.

E. K. ARMSTRONG.

**Deaver, J. B.: Recurrence of Symptoms After Operation for Gall-Stone Disease. *Illinois M. J.*, 1916, xxix, 419.**

During the period from January 1, 1910, to January 1, 1916, 1,031 operations upon the gall-bladder or biliary passages were performed at the German Hospital, with a total mortality of 7.18 per cent.

The type of operation and the mortality of each is shown by the following table:

	Operations	Deaths
Cholecystectomy.....	360	36
Cholecystectomy and choledochostomy.....	114	4
Cholecystostomy.....	427	12
Cholecystostomy and choledochostomy.....	28	4
Cholecystostomy, choledochostomy, and pancrea- tostomy.....	1	1
Cholecystoduodenostomy.....	35	4
Choledochostomy.....	63	13
Choledochoduodenostomy.....	2	..
Cholecystogastrostomy.....	1	..
	1,031	74

Mortality, 7.18 per cent.

During the same period and included in the above were 42 cases that had been operated upon previously for the same disease. Of these 5 had had two previous operations and one had been operated upon 3 times without relief. In all 50 operations were performed upon these 42 cases. The operative mortality in this group was exactly 8 per cent. The 4 fatalities were due in one case to uncontrollable hæmorrhage, in another to the same cause plus leakage from a cholecystoduodenostomy, in the third from toxæmia and exhaustion, and in the fourth, which was the case mentioned as having had 4 operations, death was due to acute pancreatitis and carcinoma of the head of the pancreas.

It would appear that gall-stones are the most common cause of the recurrence or persistence of symptoms after operation. They make their presence known within a year and often within a few days or weeks. They are usually stones that have been overlooked or out of reach, but, if the gall-bladder has been left, the possibility of reformation of stones cannot be disregarded.

In 8 cases the cause of later trouble was either failure to dislodge infection or a re-infection of the biliary passages and pancreas. Chronic and acute cholecystitis without stones was found in 3 instances and chronic pancreatitis in 5.

The author feels that the percentage of failures from these sources would have been much higher had he not laid great stress upon free and long-continued drainage of either the gall-bladder or common duct or both in all operations upon the biliary passages. The use of maximum-sized tubes which are allowed to remain until they practically fall out has been his rule. Operative biliary fistulae always close if there is no obstruction to the normal passages, and the physiological rest afforded by free drainage is of the utmost value in allowing the tissues to clear away the lurking infection.

Stricture of the common duct was met with in 6 instances. In 2 they could fairly be attributed to surgical treatment since in one the duct was accidentally injured during cholecystectomy, and in another a severe local infection caused sloughing of a portion of the duct itself. In the other 4 cases the condition was secondary to extensive and long-continued disease of the duct, such as suppurative and ulcerative cholangitis, and might have been obviated by earlier operation.

In 4 cases the only lesion that could be found to account for the symptoms was the presence of adhesions. It must be said, however, that adhesions, often extensive and dense, were present in all of the cases. They are part and parcel of the healing process. It is a difficult matter to say just what part adhesions play in the production of symptoms. Where they produce definite kinks or obstructions of the stomach, duodenum, or intestines it is not so difficult to correlate the mechanical conditions with clinical effects. The author does not disturb adhesions when operating, unless they are in the way. As a rule they cause no trouble and, if disturbed, they are sure to re-form and probably more densely than before.

More recurrences took place after simple drainage of the gall-bladder than when it was removed. Thus, in half of the stone cases recurrence was due to calculi left or re-formed in the gall-bladder. In one case stones were impacted in the cystic duct and would have been removed by cholecystectomy. When stones are overlooked in the common or hepatic duct, it is, of course, clear that the treatment of the gall-bladder is of no moment so far as subsequent obstructive symptoms are concerned. It is better to remove the diseased gall-bladder when complicated by pancreatitis.

The causes of recurrent symptoms following operation for gall-stone disease are the following:

Late operation and extensive pathology.

Type of operation not adapted to the lesion.

Overlooking stones in the gall-bladder or ducts.

Reformation of stones.

Persistence or recurrence of infection of gall-bladder, ducts, or pancreas.

Insufficient drainage.

Adhesions, especially adherent duodenum, pylorus, or stomach.

Internal biliary fistula.

External biliary fistula.

Contraction of papilla of Vater.

Stricture of the common duct.

Stricture of the hepatic duct.

Stricture of the cystic duct.

Chronic pancreatitis, pancreatic lymphangitis, and interstitial pancreatitis.

The type of operation done must necessarily influence the result: for example, draining the gall-bladder when it should be removed or vice versa; draining the gall-bladder externally when it should be drained into the duodenum; failure to drain when there is present a cholangitis, a pancreatic lymphan-

gitis, or interstitial pancreatitis; omitting properly to explore the hepatic and the common duct; omitting definitely to determine the patulousness of the cystic duct when draining the gall-bladder; failure to recognize a stricture or a growth of the cystic, the hepatic, or the common ducts; failure to detect a stricture and to dilate to the normal the orifice of the papilla.

The most common error in operating for gall-stone disease is failure to remove all of the stones.

A stricture of the common duct with a normal gall-bladder and with a patulous cystic duct may be corrected by a cholecystoduodenostomy.

Pancreatic lymphangitis and chronic interstitial pancreatitis are amenable to treatment by drainage only. It may be established by making an external gall-bladder fistula or by a cholecystoduodenostomy or by draining the common duct.

Contraction of the papilla of Vater, with consequent obstruction of the common duct, calls for dilatation of the papilla carried out gradually through an incision into the duct.

An adherent duodenum is capable of causing symptoms which may be interpreted as ulcer. An attempt should be made to separate an adherent duodenum or stomach, but if this cannot be done safely a gastro-enterostomy is better.

Acute and chronic cholangitis are amenable to treatment only by bile drainage, best carried out by introducing a rubber T-tube into the common duct. Acute cholangitis, due solely to inflammatory obstruction, is comparatively rare; it does not differ from lithogenous obstructive cholangitis and likewise calls for the establishment of free drainage.

Diseases of the biliary passages are surgical and not medical conditions, and until this is instilled into the minds of our medical colleagues, recurrence of symptoms following operations will continue to be as important a factor in the future life of patients operated on as it is at the present time.

The root of the chief evils that befall the biliary passages is, primarily, infection, and, secondarily, obstruction. If the biliary passages never became infected, the latter would never occur, except more rarely from congenital malformations or neoplasms. The order of sequence, therefore, is infection, inflammation, inflammatory swelling, obstruction, and retention of bile, and often precipitation of its contents forming calculi. EDWARD L. CORNELL.

**Judd, E. S.: Cholecystitis; Changes Produced by the Removal of the Gall-Bladder.** *Boston M. & S. J.*, 1916, clxxiv, 815.

Judd briefly reviews the subject of cholecystitis, shows the changes following cholecystectomy, and emphasizes a few important points in the technique.

Of the many avenues through which bacteria may reach the biliary tract, the systemic circulation, of late, is believed to be the most important. Thus, the bacteria are lodged directly in the walls of the gall-bladder. Rosenow also demonstrated the selective action of the bacteria by inoculating 41 ani-

mals with different strains of bacteria isolated from infected gall-bladders and produced similar lesions in 80 per cent of the animals. Under such circumstances, cholecystectomy is the logical procedure.

Next in importance is the invasion from below through the cystic duct, complicating duodenal ulcer. As the mucous membrane resists invasion for some time it follows that stones may form around the bacteria before infection occurs. Under these circumstances, drainage is sufficient.

It is frequently difficult to diagnose cholecystitis even with the abdomen open. The color of the gall-bladder, consistency of the bile, and appearance of the mucous membrane must be taken into consideration. C. H. Mayo regards the enlargement of the regional lymphatics as most important in indicating infection of the gall-bladder. Likewise, interval attacks are more pronounced in cases in which stones are the main factor and with but slight infection of the tissues.

Malignant disease of the gall-bladder is rare and, the Mayos assert, is always accompanied by stones.

In empyema of the gall-bladder, the walls are thick with much fibrous tissue and the mucous membrane destroyed. Cholecystectomy is indicated.

In chronic catarrhal cholecystitis the strawberry appearance is due to the erosion of the apices in the mucous membrane. Stones are seldom present.

The exact function of the gall-bladder has never been definitely established beyond acting as a reservoir for bile. C. H. Mayo and Deaver, however, are of the opinion that it acts as a tension-bulb and that during fluctuations of pressure in the ducts, which probably occur as a normal consequence of digestion, the gall-bladder may spare the parenchyma cells of the liver from back-pressure.

The effect of removal of the gall-bladder is dilatation of the ducts; the greatest amount appearing in the hepatic duct. This dilatation, however, stops short at the surface of the liver and does not appear in the pancreatic ducts. It is in great part due to the resistance of the sphincter at the ampulla of Vater, first demonstrated by Oddi and later by Archibald. This resistance is eventually overcome by the pressure in the ducts, the bile then flowing freely into the duodenum. This would explain the relief of the pancreatitis which so often accompanies cholecystitis. This pancreatitis is probably due to a back pressure of the bile into the pancreatic ducts, undiluted by mucus from the gall-bladder which normally protects the pancreas from the bile-salts.

Two cases are cited in which dilatation of the bile-ducts was demonstrated following previous removal of the gall-bladder.

Cholecystectomy, under these circumstances, must be considered the operation of choice. C. H. Mayo shows that in proper hands the mortality is no higher than cholecystostomy with drainage.

In the operation, good exposure is essential, and the best incision is one beginning just to the right



of the ensiform and extending obliquely to a point about two inches to the right of the umbilicus. The suspensory ligament is cut if necessary; the cut end being used as a tractor for lifting the liver.

It is usually advisable to begin by dissecting free the cystic duct and lower end of the gall-bladder before clamping or tying; thus preserving the common or hepatic duct from trauma.

The author's conclusions are:

1. The systemic circulation is one of the most important avenues of bacterial invasion in cholecystitis.

2. Cholecystitis is often difficult to diagnose even with the abdomen open.

3. The clinical history is a most important factor as well as the enlargement of the regional lymphatics.

4. Chronic cholecystitis without stones does exist as such and is best relieved by cholecystectomy.

5. The only change produced by cholecystectomy is dilatation of the bile-ducts, being most marked in the hepatic duct.

6. Eventually this dilatation overcomes the sphincter in the ampulla of Vater allowing a free flow of bile into the duodenum, which accounts for the relief of the accompanying pancreatitis.

7. These changes indicate a definite function for the gall-bladder.

P. M. CHASE.

**Holmes, J. B.: Congenital Obliteration of the Bile-Ducts; Diagnosis and Suggestions for Treatment.** *Am. J. Dis. Child.*, 1916, xi, 405.

The author reports a case occurring in a boy living to be fifteen weeks old, who presented all the usual signs of obstruction to the bile-ducts.

At autopsy the anatomical relations of the liver and adjacent organs seemed quite normal, as did also the lobulation of the liver. The gall-bladder was represented by a fibrous cord with two dark, greenish-black enlargements containing bile and thick mucus. The hepatic ducts were three in number — one to the left lobe, one to the anterior half, and one to the posterior half of the right lobe — and met in a common chamber. This chamber or globular dilatation of the common duct measured from 2 to 3 mm. in diameter. The three orifices of the hepatic duct were clearly seen and fine probes could be passed up each one even to the liver substance. A very fine duct led upward from this chamber toward the nearest enlargement of the gall-bladder tract and from this enlargement a fine lumen, which admitted a double platinum wire, led downward. A space of 0.5 cm. remained without a demonstrable lumen. Distally from this last-mentioned enlargement a lumen was readily demonstrated and a fine probe passed through to the second enlargement. This ended blindly at about the position of the end of a gall-bladder of normal size. From the chamber that received the hepatic ducts, a fibrous cord led downward toward the duodenum. The papilla of Vater was present

and of normal appearance. The pancreatic duct opened into it normally. There was a second small duct leading toward the fibrous cord just mentioned, but ending blindly at about 4 mm. distance. Beyond this the fibrous cord representing the common duct appeared to be without lumen.

The liver-sections showed quite marked biliary cirrhosis. The liver-cells were of normal appearance but not always well stained; their nuclei were well preserved. The capillary spaces between the columns of liver-cells were large and well filled. The endothelioid cells lying in these were plainly visible. They were not pigmented. Small collections of granular material, which appeared to be bile pigment, were found here and there apparently free in the capillary spaces and between or upon the columns of liver-cells. The cirrhotic areas contained small collections of lymphoid cells and delicate connective-tissue cells. At the edges this tissue blended almost imperceptibly, through gradual transitions, into the normal liver parenchyma. The typical liver-cells laid adjacent to others with progressively less protoplasm and less typical appearance until gradually they were lost among the mononuclear cells and young fibroblasts. Quite normal looking bile capillaries and ducts were seen in the cirrhotic areas and also large sinusoidal spaces filled with coagulated material that seemed to be serum.

The author gives a comprehensive review of the condition as follows:

1. It would seem that the cause of congenital atresia of the bile-ducts must be sought, as a rule, in a faulty development from the primary tissues. What the causes of this are is scarcely known. They are doubtless the same as those operative in the production of atresias in other tubular structures.

2. There appears to be a considerable range of normal variation in the gross anatomy of the biliary tract and in the width of the various lumina. When the lumen is unusually narrow, or where traction, pressure, or other force tends to obliterate it, it seems probable that the walls of the duct might adhere and patency be lost.

3. After birth, and after the invasion of the gastro-intestinal tract by micro-organisms, catarrhal processes in the biliary passages are not uncommon. It seems probable that these may, in rare instances, lead to obliterations of the duct that closely simulate the congenital condition.

The author reaches the following conclusions:

1. Congenital obliteration (atresia) of the larger bile-ducts is not an extremely rare condition. It deserves more attention from clinicians.

2. Accumulating evidence tends to show that the condition is usually a developmental anomaly and not the result primarily of inflammatory processes.

3. In at least 16 per cent of all cases yet reported the anatomical relations are such that operative relief is theoretically possible.

4. Recent surgical experiences in young children afford clinical basis for such hopes.

5. In view of the otherwise hopeless nature of the case, the biliary tract should be explored as soon as the diagnosis is sufficiently established, and if the anatomical relations permit — 16 per cent of published cases — an artificial passage for the bile to the duodenum should be made. When, for any reason, this cannot be done at the time of exploration, an external outlet for the bile should be provided. A repair operation may be attempted at a later date. Meanwhile the child's nutrition should be maintained by the administration, if necessary, of bile or bile salts.

EDWARD L. CORNELL.

### MISCELLANEOUS

**Davis, J. D. S.: Value of Pain, Jaundice, and Tumor Mass in the Differential Diagnosis of Diseases of the Right Upper Quadrant of Abdomen.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

The usual symptoms of peptic ulcer are pain, vomiting, and hæmorrhage; the most important of which is pain.

Pain is the earliest definite symptom. It is usually aggravated by large amounts of food and often relieved by small amounts. Pain may come on during ingestion of food but more frequently comes on a few hours after meals and at night. Gastric ulcers are often characterized by periods of long remission, intermittency occurring for long periods of time during which the patient often believes himself well.

The X-ray examination will often be a helpful aid in determining the presence of peptic ulcer. Much valuable information may be secured by the roentgenologists, many of whom claim to diagnose 75 per cent of ulcers.

Peptic ulcer diagnosis is usually based upon the presence of localized pain, followed by vomiting, frequent presence of occult blood in gastric contents or stools, hypersecretion, increased amount of gastric contents, reliable findings with the X-ray, and often history of an old irritated dyspepsia.

Hæmorrhagic pancreatitis is sudden and violent in onset; is characterized by excruciating deep-seated pain usually in the epigastrium or between the xiphoid and umbilicus, associated with severe nausea and vomiting, hiccough, constipation, and albuminuria frequently results.

Acute suppurative pancreatitis usually begins suddenly with severe epigastric pain, vomiting, hiccough, chills, and an irregular pyæmic temperature and progressive tympanitis.

In pancreatic calculi paroxysms of pain may be due to the impaction of stone. The pain radiates along the lower left costal border to the back rather than to the right side. Detection of free fat in stools or glycosuria may markedly aid in the

diagnosis. Characteristic calculi found in the stool is confirmatory. Jaundice rarely appears in pancreatic lithiasis unless the stone passes into the common duct and becomes lodged. If this takes place or if pressure is made upon the common duct by inflammatory swelling, jaundice may occur.

In cholecystitis pain may or may not be very severe, depending largely upon the amount of obstruction produced by the swelling in the ducts.

Epigastric pain with local soreness beneath the right rib margin is usually followed by nausea and vomiting. When the common bile-duct is occluded jaundice with chills and high temperature may result.

Renal calculus is accompanied with severe pain when the stone gets into the kidney pelvis or ureter in such a position as to block the flow of urine. The pain radiates from the loin obliquely downward into the right iliac region — the front of the thigh, bladder, or genital organs. Symptoms from renal stone depend upon the size, character, and location of the stone. The pain may appear suddenly and is of an agonizing character, associated with marked muscular rigidity or spasm. If the stone passes, pain may suddenly cease, leaving the bladder more or less irritated. If the stone is rough it may produce much irritation and hæmorrhage. If the ureter remains long blocked by a stone, hydronephrosis marked by a tumor mass beneath the costal region may be found. When suppuration occurs in connection with stone, pyonephrosis results and pus, blood, casts, and albumin may be found in the urine, and septic symptoms may result.

The liver when enlarged from hepatic abscess may extend several inches below the rib border. When due to amœba or other infections, dull aching pains are present all over the abdomen. The pain is most active during the night or early morning. Indigestion, headache, lassitude, coated tongue, and a foul breath may be present. Loss of appetite, weight, and color may take place and at times a yellow skin. Chills, and rigors at times occur with pain and tenderness over the liver. If the abscess swelling is sufficient to press on the bile radicles the jaundice is slight, but if the pressure is sufficient to obstruct the common or hepatic duct there will be marked jaundice.

Floating kidney pain is not so severe as that from renal stone and is localized in the right side of the abdomen. If the ureter is flexed or pressed upon by the descent of the kidney, pain will result. If a band of fascia or blood-vessel is abnormally located so as to drag across the ureter in the kidney descent in a manner to obstruct the ureter, the patient may suffer pain in the loin which may be projected down along the ureter. When the attachments are loose enough to admit free mobility of the kidney, the ureter is not liable to kink and the kidney remains symptomless.

Nephromata or hypernephromata cannot often be distinguished from floating kidney. It is usually



tender to pressure but unaccompanied by pain. Nephromata may or may not be associated with sex abnormalities.

In appendicitis the pain in a large number of cases occurs at the epigastrium and then is diffused over the abdomen and generally localizes at or near McBurney's point. If the appendix is long enough to extend into the region of the gall-bladder and ducts its inflammation may excite symptoms of cholecystitis or choledochitis and the pain may be at the rib border. If located behind the cæcum pain may be referred to the loin or to the right rib margin. If in contact with the ureter the pain may simulate that of renal stone. Regardless of its location it is often the cause of gastro-intestinal disturbances — pylorospasm, hyperchlohydria, and general intestinal irritation. Appendicitis is usually accompanied by temperature, high or low. In fact, in acute attacks elevation of temperature is the rule. Its existence is often doubted when other symptoms are unaccompanied by temperature. Nausea and vomiting are usually present in all of these conditions, but are not significant or especially characteristic.

Jaundice is a valuable diagnostic sign. It appears in appendicitis and renal disease only as a result of sepsis.

Obstructive oedema due to a duodenal ulcer near the ampulla of Vater sometimes results in a closure of the common bile-duct and may cause pancreatitis and jaundice.

Choledochitis and cholelithiasis are accompanied by slight or marked jaundice which may be of an intermittent or transient type. It may be so slight that an examination of the conjunctiva or a chemical examination of the urine is necessary to detect it.

Pressure by pyloric cancer upon the common duct may give rise to jaundice of a constant, progressive, intense type.

Peptic ulcers both of the stomach and duodenum are at times so infiltrated as to cause a tumor mass that may be felt in the median line or beneath the right rectus muscle which is at times very tender to touch. Pyloric cancer produces a tumor that at times is freely movable upon full inspiration and is separated from the costal margin by a distinct depression. They are usually far advanced when palpable — "firm, irregular, often painless, and not very tender to pressure."

When the gall-bladder is disturbed from obstruction to the cystic or common duct it produces a pear-shaped tumor mass at the margin of the liver; movable synchronously with the diaphragm and presenting no depression between the rib margin and the tumor mass.

Appendiceal tumors may be located anywhere in the abdomen. They are sometimes six or more inches long and may become attached to any other abdominal organ. When inflamed they may become fixed by adhesions to some surrounding tissue.

Floating kidney tumors are usually marked by smooth, sharp outlines and mobility. They are usually free from pain and tenderness unless obstruction results from ureteral pressure.

A hydronephrotic or pyonephrotic kidney is usually stationary or fixed well back into the loin and does not move with the diaphragm. The hydronephrotic kidney usually presents no urinary findings, while the pyonephrotic kidney is usually accompanied by septic symptoms, the urine showing blood, pus, albumin, and casts.

Pain is the most prominent symptom in all conditions of the right upper quadrant, and is of great value in a differential diagnosis, if the peculiarities and characteristics of pain common to each condition is kept in mind.

Regardless of every aid in diagnosis it is often difficult to differentiate and instead of waiting months or years for the trouble to clear up an exploratory diagnosis under nitrous oxide gas-oxygen or novocaine should be made.

**Peak, J. H.: Visceroptosis.** *Internat. J. Surg.*, 1916, xxix, 193.

The author's principal aim in this paper is to show the development of operative procedures for the relief of visceroptosis. In so far as the morbid entity and what might be termed the medicinal treatment may be concerned, every physician ought to be perfectly familiar with these features, therefore, the author deals briefly with the surgical phase of the subject in concluding his paper.

The extent and character of the existing ptosis will necessarily determine the surgery to be undertaken. The rule the author follows, if the patient is a relatively good surgical risk, is to first perform nephropexy; then place the patient on the back and open the abdomen in the median line above the umbilicus; abrade the upper surface of the liver with a gauze sponge; shorten the round ligament of the liver; plicate the gastocolic ligament and anchor the colon by attaching the greater omentum where it comes off the colon to the abdominal wall at about the normal level of the colonic position. (This last procedure the author has performed many times during the last ten or fifteen years.)

Following the operation the patient is placed in bed with the foot elevated ten or twelve inches. This position is necessary in order that adhesions may form properly about the kidney and liver. An exceedingly light diet is maintained and the bowels kept open by enemas rather than purgatives. The patient should be maintained in this position for twenty-one days, but can be shifted slightly from side to side to change the center of gravity and thereby give the parts rest. At the end of the third week the foot of the bed may be lowered to the normal level, and the patient will be able to leave the hospital at the end of the fourth week.

EDWARD L. CORNELL.

## SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES,  
TENDONS. CONDITIONS COMMONLY  
FOUND IN THE EXTREMITIES

**Cunningham, S. P.: Regeneration of Long Bones Following Infection.** *Texas St. J. Med.*, 1916, xii, 15.

The author considers the methods of treatment which have been of most value in treating infected long bones resulting from compound, comminuted fractures. The principles to be kept in mind are: (1) the general condition of the patient; (2) the injured member should be placed in as nearly a normal position as can be maintained without interference with the blood supply by sand-bags and extension; (3) when infection is severe, hot, moist applications should be made to the part to promote drainage, and a splint applied under the limb to facilitate the changing of dressings. Probing, manipulation, and irrigation should be avoided. After infection is controlled the author uses the Moorhof wax to dry fill the cavity. He has reached the conclusion that bone regeneration is the result of the combined action of the periosteum and blood-clot. Two cases are reported.

H. W. WILCOX.

**Cameron, H. C.: Osteogenesis Imperfecta.** *Proc. Roy. Soc. Med.*, 1916, ix, *Sect. Dis. Child.*, 43.

A case is reported of this rather rare bone condition in a child aged five years.

The author makes these three observations: (1) Osteogenesis imperfecta is a condition characterized not only by deficient ossification and fragility of the long bones, but also by a typical and peculiar formation of the skull which consists of a bulging in the temporal region sufficient to displace the upper part of the ear. (2) The shortening of the limbs is more marked in the proximal than in the distal portions of the limbs. Characteristic expansion and the tortuous, sinuous outline of the shafts of the long bones are noted.

H. W. WILCOX.

**Remy, C. E.: Blue Sclerotics; Their Relation to Multiple Fractures in Childhood.** *Med. Council*, 1916, xxi, 33.

The author traces the heredity of blue sclerotics or osteopsathyrosis, and finds that with one exception the condition of fragile bones was transmitted by the females and occurred only in the males. He also finds that in addition to the fragility of the bones and the blue sclerotics, in all cases presenting blue sclerotics, there is an accompanying flat-foot and a peculiar tendency of the lower eyelid to cover the lower portion of the iris. He thinks the condition is due to a congenital deficiency of the matter furnishing the bones their elasticity.

J. R. MARTIN.

**Wilcox, H. W.: Osteo-arthritis.** *Colo. Med.*, 1916, xiii, 153.

The author uses the classification of Goldthwaite and gives a review of the present-day beliefs concerning the etiology and treatment of osteo-arthritis. Some of his conclusions are as follows:

1. Any inflamed joint should be put as far as possible in a condition of absolute rest. This relieves pain and tends to arrest changes going on in the joint tissues, thus preventing deformity and possibly ankylosis.

2. If the focus of infection is known and is accessible to removal it should be gotten rid of.

3. If there are deformities which can be corrected, either in the diseased joint or in another joint closely related to it, any such static fault should be corrected and the joint held in normal position by whatever means necessary.

4. Internal medication seems not to influence the reparative process greatly.

R. B. COFIELD.

**Marshall, H. W.: A Case of Multiple Cartilaginous Exostoses.** *Am. J. Orth. Surg.*, 1916, xiv, 346.

The author reports a typical case of multiple osteochondromata. X-ray plates demonstrate abnormal growths in the cervical, dorsal, and lumbosacral regions of the spine, on the right scapula and both iliac bones, femori, tibiae, fibulae, left humerus, right radius, left ulna, and first metacarpal bone of the right hand. Excision of a small tumor on the fifth cervical vertebra was followed by relief from slight aches previously complained of locally in the neck and head. Microscopic sections of the excised mass indicate its benign character, and show an irregular grouping of hyaline cartilage and bony trabeculae surrounding the bone-marrow.

The history in the author's case tends to confirm the opinion as to the importance of congenital developmental defects as causes and their transmission from mother to offspring; also the location and size of abnormal growths indicate that continuous mechanical strains or repeated mechanical irritations may accelerate tumor growth.

PHILIP LEWIN.

**Greig, D. M.: A Case of Symmetrical Pressure Fibromata.** *Edinb. Med. J.*, 1916, xvi, 444.

The clinical findings in this case were hard movable growths, with fascial attachments, just posterior to each great trochanter of the femur, and over each ischial tuberosity. The tumors at the trochanters were removed and on examination were found to be composed of a dense fibrous material, in the center of which were found tubercles with the accompanying lymphoid and giant cells, but no demonstrable tubercle bacilli. The author was inclined to believe that the growths were either desmoidal or bursal in origin and were results of irritation.

J. R. MARTIN.



**Moore, J. E.: Osteomyelitis Involving the Hip-Joint.** *Ann. Surg.*, Phila., 1916, lxiii, 473.

Eighteen years ago the author denounced the use of the term epiphysitis, as applied by most writers to an acute inflammation of the hip-joint. He believed then that the condition was one of acute osteomyelitis, and subsequent observation has confirmed his opinion that the condition does not arise in the epiphysis, but on the shaft side of the bone. The term epiphysitis was suggested by Macnamara because of the rarity of osteomyelitis in this location and the absence of a diagnosis until the epiphysis had become separated. The name osteomyelitis as applied by the author is not strictly correct, as the neck of the femur has no medulla, but the process resembles osteomyelitis in every other particular and demands the same prompt treatment. When the diagnosis is made very early, before the joint is involved, an incision should be made over the greater trochanter and an opening drilled through the trochanter and the center of the neck of the femur in its long axis until the seat of the infection is reached. When the diagnosis is not made until the joint is involved, it is better to open directly into the joint from the front. When a late operation is done, a formal excision should not be made unless the neck is completely necrotic, but as much as possible of the neck should be preserved for future use.

Four cases are cited as proof of the correctness of the author's contentions. All of them occurred in children under twelve, and all involved the neck, some with and others without joint involvement. He suggests that it might be well to revive the old term "acute osteitis of growing bone." GATEWOOD.

#### FRACTURES AND DISLOCATIONS

**Campbell, W. F.: Colles' Fracture.** *Med. Times*, 1916, xlv, 161.

The author gives a detailed discussion of Colles' fracture. He contends that the reasons for imperfect reduction of these fractures are largely a lack of appreciation of the fact that the fractured fragments are locked, impacted, and must be disengaged before they can be normally replaced. In order to accomplish this, anæsthesia for securing complete relaxation is essential. Colles' fracture is not an "office fracture," it is a "hospital fracture;" and if the fragments are accurately reduced, retention is easily accomplished with almost any kind of splint.

R. B. COFIELD.

**Serafim, G.: Isolated Fractures of Head of the Radius** (Sulla frattura isolata del capitello del radio). *Clin. chir.*, 1916, xxiv, 177.

Pure isolated fractures of the radius are comparatively rare. The author gives a short historical review of the subject from Verneuil's memoir in 1851 down to the present time. He divides traumatic lesions of the head of the radius into the three following classes:

1. Fractures which involve the head alone, either complete or incomplete.

2. Fractures which involve both the head and neck of the radius in which the direction of the line of fracture injures the mass of the head for a much greater extent than the neck, complete and incomplete. These are fractures of the head radiating to the neck.

3. Fractures associated with the head and neck, so-called explosive fractures, in which the fractured diaphysis at the level of the neck supplemented by the continuation of the traumatizing action indirectly in the head of the radius which is broken into several fragments. In this variety, fracture of the neck is primary and of the head secondary.

The author gives short histories of 57 cases gathered from the literature and adds fuller details of 7 personal cases which he has observed in five years. In 22 cases the injury was caused by a fall on the palm of the hand with the forearm in flexion. In 28 cases the injury was due either to a fall on the elbow or to the elbow striking some hard object.

Generally such fractures are more frequently due to direct than to indirect trauma. The etiology, mechanism, pathologic anatomy, symptoms, diagnosis, surgical and non-surgical treatment as well as the results, are discussed.

Clinically such fractures are recognized by the tumefaction and the pain localized to the external part of the elbow under the epicondyle; by the limitation of movements, especially of pronation and supination, and by the dislocation and malposition of the fragments. Clinical examination should invariably be supplemented by radiography of the elbow in different positions.

Mobilization and massage may give good results but if there are free articular fragments and the head is badly dislocated early operative intervention is called for. The latter gives excellent results and is preferable to late intervention. It is indicated generally when callus formation is noted. The ultimate results as to functional value cannot be stated until at least a year has passed after the injury. With free fragments the ultimate prognosis may be grave.

W. A. BRENNAN.

**Jones, R.: Malunited and Ununited Fractures.** *Brit. M. J.*, 1916, i, 809.

The author states that conditions to which the terms delayed union and non-union are applied may be difficult to distinguish, because there is often found, even after months, osteogenetic changes leading to consolidation in a fracture considered to be permanently united. There may be several weeks of apparent inactivity in callus formation, and then consolidation occurs quite rapidly. Delayed union is the most common in the middle of the femur, in the humerus at the junction of the middle and upper third, and in the tibia and fibula at their lower third.

A fundamental principle in the treatment of fractures is to secure and maintain good length and good alignment and in securing these ends care

should be taken that the circulation of the limb should be in no way impaired.

If a case of delayed union is first seen in the seventh or eighth week it is necessary to do no more than make quite sure of good alignment, length, and circulation.

For old cases Jones recommends the "percussion and damming" of H. O. Thomas which consists of breaking down the soft fibrous callus, turning the fractured ends toward the skin and beating them with a mallet. A pulley is then applied to the limb and extension produced. A Thomas knee-splint is adjusted and the extension maintained. Two pieces of rubber tubing are tied around the limb, one three or four inches above the fracture; the other an equal distance below. At first they are kept on twenty minutes each day, later on several hours at a time. They should be tight enough to cause considerable swelling and stasis.

In aseptic compound comminuted fractures Jones strongly recommends that the pieces be saved. If the pieces are quite loose they should be taken out, laid in alcohol, and carefully replaced in position or around the site of fracture.

Weak union can be diagnosed by two signs:  
(1) tenderness on pressure over the site of fracture;  
(2) exuberant callus exudation.

The causes of malunion of a fracture are:

1. Inefficient reduction of fracture.
2. Errors in method of maintaining the fracture in position.
3. Errors in after-treatment. PHILIP LEWIN.

**Carr, W. P.: The Treatment of Fractures.** *Lancet-Clin.*, 1916, cxv, 493.

On the basis of twenty years' experience in the Emergency Hospital in Washington, and having treated more than 7,000 fractures of nearly every bone and variety, Carr contends that we are retrograding in the proper treatment of fracture instead of advancing. He believes that many surgeons are too prone to amputate, too ready to operate, and too apt to use faulty methods of operating.

The methods of Lane and Milne of England are condemned since the use of plates breaks some of the most important fundamental laws governing the treatment of fractures; such as:

1. Continued pressure upon bone causes its rapid absorption.
2. Large foreign bodies embedded in bone frequently cause, without apparent infection, a rarefying osteitis.
3. Cutting off the blood supply of a part of the periosteum by pressure is equivalent in effect to removal of this periosteum.

Other important laws laid down in this paper are:  
(1) It is impossible to hold down a fragment of bone, tending to ride upward from muscular action, by putting compresses over it. (2) Any incision through muscle playing over a bone, down to the bone, may produce scar tissue binding the muscles to the bone at that point and interfering more or less

seriously with motion. (3) Continued irritation of muscle and tendons at the seat of fracture often produces thickening and contraction of these muscles or tendons, and such contractions may seriously impair the motion of a joint. (4) Infection at the site of fracture almost always interferes seriously with union. (5) Mangled and lacerated wounds are far more liable to infection than clean cut incisions.

These laws are fixed and immutable and the ignoring of some of them has led to pernicious methods of treating fractures that have come into common use under the sanction of high authority. Short fragments may be held in place by wiring. No appliance, however, should be fastened directly to the broken ends of long bones for the purpose of keeping the fragments in alignment, but only to prevent shortening. The alignment must be maintained by splints, casts, or extensions — never by metal plates or any appliance encircling the bone, or by wires passed through and through the broken ends.

R. B. COFIELD.

**Nathan, P. W.: Choice of Method in the Treatment of Fractures.** *Am. J. Surg.*, 1916, xxx, 184.

Nathan deplores the percentage of poor results in fractures handled by the average practitioner, and says that the average graduate has not been taught the application of ordinary mechanical methods. The essential fault is that the splint so often does not overcome the muscular spasm, which is the primary cause of overriding fragments, and that when used, the plaster of Paris is not properly applied, nor retained until consolidation takes place.

In fractures of the shaft of the femur, the fragments are the best apposed, and greatest muscular relaxation is gained by a position of semiflexion of the limb. The additional advantage of continuous extension is readily acquired by a simple apparatus of gas-pipe, adjusted to fit in any bed, and capable of maintaining an extension frame at any angle desired.

In fractures of the surgical neck of the humerus, the arm should be abducted and externally rotated. For fractures of the femoral neck, the Thomas hip splint may be modified to keep the limb in abduction.

The best method in fracture treatment is that which requires the least skill to carry out, rather than the fine elaboration of surgical technique.

R. G. PACKARD.

**Flint, J. M.: Treatment of Fractures by Methods of Suspension and Extension.** *Ann. Surg.*, Phila., 1916, lxiii, 641.

Especial attention is called to the value of extension when combined with suspension in fracture treatment. It is necessary in this kind of treatment that there be some sort of iron frame firmly attached to the head and foot of the bed and five feet above its surface to give movable points of support with adjustable pulleys. With proper adjustment, the best methods are easily determined for suspension of simple fractures, or for doing painless dressings in such cases as compound fracture of the el-



bow, or for complex appliances for badly complicated fractures. The addition of a spring in the line of pull, as a shock absorber, is a wonderful source of relief to the patient.

In fractures of the humerus, the extension can be vertical, horizontal, or angular, and in cases just above the elbow this angle of the arm and forearm can be varied several times during the day to avoid ankylosis formation, and meanwhile the patient can sit, lie, or sleep.

Suspension of the lower extremity is variously used. In fractures in good position hammocks may be used allowing the patient to rotate the limb. For tibial and fibular fractures requiring extension, and for supracondylar fractures, the "railway splint" with the self-contained extension apparatus may be used, so-called because the lower fragment rides upon a carriage that tracks on the main part of the splint, while countertraction is obtained by adhesive plaster over the upper fragment attached by a helical spring to the splint. Subtrochanteric cases need the Hodgen splint. Fractures of the femoral neck require the Hodgen splint with foot extension.

R. G. PACKARD.

#### SURGERY OF THE BONES, JOINTS, ETC.

**Harrison, F. C.: A Splint for Drop-Wrist.** *Canad. Pract. & Rev.*, 1916, xli, 191.

The author describes an easily constructed splint by Southerland to be used in the treatment of injuries to the musculospiral or median nerves, from which "drop-wrist" results.

A posterior splint for the hand and arm is made of several layers of plaster-of-Paris bandage three or four inches wide with a thin piece of board, one and one-half inches in width, running longitudinally nearly the length of the plaster. Three more layers of plaster bandage are applied above the board and then strips of flannel are placed across the splint for the purpose of fastening it to the hand and forearm. Two more layers of plaster bandage are then applied to secure the flannel strips. The whole is then moulded to the back of the hand and forearm, extending from the base of the fingers almost to the elbow. It is allowed to dry and is then cut across at a point corresponding with the wrist-joint and hinged, the board embedded in the plaster holding the screws firmly. A spring is then attached by metal uprights to the hand and the forearm pieces. In this way the wrist is held in a position of dorsal flexion. Flexion can take place to the extent of allowing the hand and forearm to come into line.

R. B. COFIELD.

**Rich, E. A.: The Treatment of Abscesses in the Course of Tuberculous Disease of Joints and Bones.** *Northwest Med.*, 1916, xv, 237.

The author pleads against unnecessary and dangerous incision of tuberculous abscesses, pointing out the harmlessness of the collection and the possibility of back pressure having a real function.

In his opinion, the only indication for any operative procedure is such an increase of abscess pressure as to cause intolerable pain and then the only procedure that is justifiable is aspiration under the most rigorous asepsis. Aspiration is indicated to relieve pressure and not to evacuate the cavity and in old chronic cases where the disease itself has subsided. Aspiration should be done with a No. 13 or 14 wire needle and not with a trocar. The author has had small success with the use of Beck's paste.

H. W. MEYERDING.

**Ridlon, J.: As to the Necessity for Operation in Joint Tuberculosis.** *Chicago M. Recorder*, 1916, xxxviii, 256.

The author reports two cases of tuberculosis of the knee-joint, treated by conservative methods. The first was an adult female, whose right knee-joint, following a fall upon it, became tuberculous, and was excised with a resulting ankylosis.

Subsequently the left knee became inflamed and was examined by six eminent surgeons all of whom diagnosed it as tuberculous. Conservative treatment, by immobilization, for three years, resulted in a cure with a normal range of motion.

The second case was in a girl five and one-half years old. The left knee was seen after being inflamed for a year, and was treated by the application of a brace. During the course of the treatment five sinuses opened up and discharged for many months. In three years the knee was cured in a straight position and in four years the knee could be completely flexed and the patient walked and ran without limping.

Excision should never be done in children. In adults it is a time-saving measure, but one-half such cases require amputation later on. H. W. WILCOX.

**Belot and Filhoulaud: Osseous Repair and Proliferation** (Sur la réparation et la prolifération osseuses). *J. de radiol. et d'électrol.*, 1916, ii, 87.

Radiologic study of osseous traumatism of war shows that apart from those which cover spontaneously there are many with a different evolution. There may be an exaggerated osteoperiosteal proliferation. The neoformation may take the form of a voluminous callus surrounding or immobilizing a joint or involving the muscles, and the functional importance engendered may be such as to require surgical removal of the excrescence.

The callus formations observed in peace are quite different from those observed in war. The latter are large, extensive, rich in elements, rapid in ossification, often proliferating at quite a distance from the point of fracture. This is accounted for by the fact that the subjects are young and in full cellular activity. There is an abundant production of fragments more or less grouped and disseminated and almost always accompanied by débris of periosteum and this latter constitutes the reparatory nucleus. These periosteal fragments scattered here and there even in the neighboring muscles continue



to live and proliferate, and multiplying their elements not only forms a voluminous callus but even an exaggerated one with distant osseous trabecules.

Traumatized bone ordinarily shows a marvelous tendency to reparation; the tendency of separated bone and periosteal fragments to live exists even when radiographically they appear deprived of all relation with the body of the bone. The author thinks that a certain amount of reserve should be exercised in the removal of all bone fragments shown by the radiograph. Only those which are manifestly incapable of living should be the object of an immediate removal. These will comprise fragments without periosteum, infected fragments, fragments very distant from the injury, etc. As regards other fragments the later clinical and radiographic manifestations will suggest what must be removed.

While it goes without saying that infective phenomena will necessitate an immediate wide cleansing of the wound it should be borne in mind that it is necessary to allow the bone sufficient elements to permit of reparation. Frequently absence of consolidation results from a too radical removal of bony débris.

It is more important to remove the fragments at a distance which are useless for reparation and which can act as foci giving birth to osseous formations.

The authors call particular attention to the value of radiologic examination not only in the diagnosis and study of fractures but for the determination of the physiotherapeutic treatment for the restoration of function. Clinical observation alone cannot always give sufficiently accurate information as to the nature of the obstacles opposing restoration of function, but radiography can detect them as well as the imperfection of consolidation.

W. A. BRENNAN.

**Delagenière, H.:** *Osteoperiostic Grafts Taken from the Tibia to Serve in the Reconstruction of Bone or in the Repair of Loss of Osseous Substance* (Des greffes osteopériostiques prises au tibia pour servir à la réparation des pertes de substance osseuse). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1048.

Delagenière gives details of 41 operations in military service in which tibial grafts have been used with good results. In his civil practice before the war the poor results which he had obtained from osseous grafts, properly so-called, forced him to renounce them in favor of osteoperiosteal grafts taken from the tibia. The tibia is easily accessible, and its internal face is large and extensive so that there is ample material for a graft. Moreover, repair of the osseous wound left after removal of a graft is facile even if the graft is thick and the medullary cavity of the bone open.

He finds that autografts are best and therefore confines his practice to grafts taken from the patient's tibia and generally for the following class of cases: (1) pseudo-arthroses of the arm, forearm, or tibia; (2) for the stoppage of loss of bony substance; and (3) in autoplasmic operations of the nose.

The result of such grafts is uniformly good. The technique of cutting the graft and applying it in the different classes of cases is described fully. The evolution of the graft is different in infected and non-infected cases. In a septic or suppurating wound the phenomena are rather complex. The periosteum grafts in this condition, but the osseous parts die and become necrotic. Fistulæ are established which heal only when the elimination of the necrotic osseous parts is complete. At this time the graft can be radioscopically observed to be transparent, but by degrees it becomes opaque and thenceforth behaves as in the evolution of a non-septic graft, except that in this case the evolution is much slower.

The author draws attention to the efficacy of this species of graft in cranial injuries where there is a very extensive loss of substance. Many of the cases reported are of this class. On account of its simplicity and efficacy he thinks it is indicated in all cases of important loss of cranial bone, and even in minor losses when the subject shows signs of meningeal irritation.

W. A. BRENNAN.

**Brown, W. L., and Brown, C. P.:** *Important Points in Bone-Transplantation*. *Texas St. J. Med.*, 1916, xii, 13.

The authors report their conclusions reached from experimental work done with bone and periosteal transplants, their results agreeing with those of the majority of investigators. They were unable to reproduce bone from periosteal transplants, either free or left attached, except from a bone where trauma was necessary to its removal, that is, only bone and bone-cells reproduce bone. Bone transplanted free into the tissues, either with or without periosteum, is always absorbed.

Bone when transplanted must be in such a position that it has a function to perform, must have sufficient contact with living bone and sufficient immobilization to secure primary union.

Clinically, the graft should not be too large, should be planted within the old periosteum, if possible, should be required to maintain but little mechanical support, and there should be complete immobilization for several weeks. The graft, in locations in which there is continued liability to displacement, requires additional internal mechanical support.

All the periosteum at the point of contact should be preserved. The technique of the bone work should be faultless.

H. W. WILCOX.

**Lyle, H. H. M.:** *The Aperiosteal Stump and Its Care*. *Ann. Surg.*, Phila., 1916, lxiii, 674.

In amputations there are four methods of treating the bone: osteoplastic, tendinoplastic, periosteal, and aperiosteal. The latter, while the simplest and most practical, is the only method most likely to give an end-bearing stump. The technique consists in removing thoroughly a small cuff of periosteum, 0.5 cm. in depth, and spooning out the mar-



row cavity for a like distance. If shreds are allowed to remain, they are liable to produce painful bony spikes.

The stump should be quickly put to use. As soon as healing is accomplished, massage is instituted twice daily and a 2 per cent solution of salicylic acid in olive oil is rubbed in. The stump should then be pressed against a box in the bed five to ten minutes, three times a day, and this period rapidly increased. Standing exercises are soon begun, and at the end of two weeks the patient should be able to wear a peg-leg.

R. G. PACKARD.

### ORTHOPEDICS IN GENERAL

**Henderson, M. S.: The Intraperitoneal Inoculation of Animals; Its Diagnostic Value in Orthopedic Surgery.** *Am. J. Orth. Surg.*, 1916, xiv, 329.

In a series of 143 patients tested by the author, guinea pigs were used in the majority of cases. As the guinea pig is rather resistant to the bovine type of tuberculosis while the rabbit is not, Henderson recommends that where the patient is a child, therefore more likely suffering from a bovine type of infection, the rabbit, or both rabbit and guinea pig, should be injected.

He concludes as follows:

1. As a test the intraperitoneal inoculation is practicable and requires no special laboratory facilities. The test has been of great value in doubtful cases, and in instances in which it is possible to obtain the material for inoculation it has become a routine procedure.

2. A positive bacteriologic test in obscure lesions makes the diagnosis certain.

3. The value of negative tests increases with the number made.

4. Antiformin digestion of tissue acts on the tubercle bacilli either to kill them or to reduce their virulence, so that the low resistance of the guinea pig will be sufficient to overcome them. It greatly reduces the value of the test and should not be used.

PHILIP LEWIN.

**Vulpus, O.: Experience with the Albee Operation for Spondylitis Tuberculosis** (Erfahrungen mit der Albeeschen Operation bei Spondylitis tuberculosa). *Muenchen. med. Wchnschr.*, 1916, lxiii, 546.

Vulpus gives the results from his orthopedic clinic in Heidelberg of the Albee operation for tuberculous spondylitis. The operation so far at least as end-results are concerned is little known to German orthopedists. He has re-examined 24 operated patients, and reports have been received of 6 others who were operated upon. About two and one-half years have elapsed between operation and the re-examination. The ages of the patients varied from 3 to 45 years, the majority being under 10 years. The typical Albee technique was used.

In all cases there was easy and uneventful recovery except in 3 cases where some bony splinters had to

be removed. After the operation there was a remarkably prompt cessation of subjective phenomena. Pain ceased after a while and the patients could easily move about. Anatomic preparations made a year after operation are instructive and show that there has been a firm union around the graft and that the graft has been absorbed. All the subsequently examined patients may be considered to be clinically cured. One child died, after a year, of tuberculous meningitis and this was the only death. No case complicated with paralysis was operated upon, and Vulpus has seen no paralysis develop after an Albee operation. In 7 cases in which there was a psoas-abscess before operation, this process was resorbed. As a result of his experience Vulpus strongly recommends the operation.

W. A. BRENNAN.

**Wallace, C.: The Operative Treatment for the Disabilities and Deformities Following Anterior Poliomyelitis.** *Am. J. Orth. Surg.*, 1916, xiv, 400.

The author bases his article on a study of the operations at the Hospital for Ruptured and Crippled Children during the past three years.

He states that the attempt to secure ankylosis of the hip in children, by doing an arthrodesis, has been hopeless.

He thinks that nearly one-third of the operations performed in the series would have been unnecessary if the patients had received proper brace attention.

The Soutter operations for contractures about the hip are most beneficial.

The transplantation of an active hamstring tendon, when both were normal, to the attachment of the paralyzed quadriceps extensor tendon, so improved the power about the knee that braces have been discarded.

Arthrodesis for paralytic deformities in children has been of little value.

The grooving of the tibialis anticus tendon into the anterior surface of the tibia, and transplanting the extensor proprius hallucis tendon to the calcaneoscapoid ligament for equinovalgus deformity has been helpful.

He found the typical Whitman operation the most satisfactory for calcaneus, calcaneovalgus, and dangle-foot deformity.

PHILIP LEWIN.

**Davis, G. G.: Stability of The Lower Extremity in Paralytics.** *Am. J. Orth. Surg.*, 1916, xiv, 391.

The author states that in treating paralysis the prime object is to secure support and secondarily to promote propulsion to the greatest extent possible. Stability is therefore the first consideration. Intimately associated with stability is the question of balance. Stability has largely to do with bones and ligaments but balance is largely controlled by the muscles.

If what the author calls the subastragalar joint is the only involved part the disability is often not marked and there are a number of ways to stabilize

it. In the order of efficiency he names arthrodesis, fixation of tendons, tendon-transplantation, and silk ligaments.

The ankle-joint is close to the subastragalar joint and the paralysis most frequently produces toe-drop, or less often a calcaneus. Even a well-laced shoe may prevent a slight toe-drop from being troublesome. If the case is more severe the foot may be held up by fastening the extensor tendons or the peronei and anterior tibial to the anterior part of the tibia. In the cases of calcaneus usually associated with cavus, Gallie buries the tendo achillis into the tibia posteriorly. Static problems of the foot are comparatively easily solved without the use of apparatus.

If a stable lower extremity is to be obtained one must favor the assumption in the knee and hip-joints of hyperextension. He can secure a stable back knee by fixation of the ankle-joint plus an elevated heel.

When the muscles controlling the hip and running from the trunk to the femur, especially the gluteus maximus, are paralyzed, the difficulties are greatly increased. If the gluteus maximus is active then, even if the quadriceps femoris is paralyzed, the gluteus will pull the femur back and frequently fix the knee, but in hip paralysis the disability is often extreme.

Where extreme external rotation is present it can be controlled by the operation of sewing the fascia lata firmly to the posterior edge of the greater trochanter while the foot is held in firm internal rotation.

PHILIP LEWIN.

**Willard, D. P.: Subastragalar Arthrodesis in Lateral Deformities of Paralytic Feet.** *Am. J. Orth. Surg.*, 1916, xiv, 323.

The operation recommended by the author consists of an arthrodesis of not only the astragaloscaphoid, but also of the astragalocalcaneal articulations, and in severe cases of varus, perhaps the calcaneocuboid joint as well. It is more than arthrodesis; it is the welding together of the adjoining surfaces of three bones, the astragalus, scaphoid, and os calcis. There is no careful dissection of the cartilaginous joint surfaces. Instead, there is a rough digging and gouging of both the articular areas, and also the bony surface between them, with no attempt at removal of the fragments that are torn loose.

The astragalus, scaphoid, and os calcis become one solid bony mass, movable in the anteroposterior directions but immobile for side movements. No shortening of the foot occurs. A rigid point of attachment is given for the unparalyzed muscles. No foreign substance is left in the tissues.

Two incisions are recommended: one on the inner side of the foot, about a fingerbreadth below and in front of the internal malleolus, on the level of the sustentaculum tali; the other on the outer side immediately below the external malleolus.

The foot is fixed in plaster, at right angles to the leg. The patient is allowed to walk in the cast at the

end of four weeks, and the cast is removed four weeks later. Unless the paralysis of the other portions of the leg demand it, no braces are applied.

PHILIP LEWIN.

**Orr, H. W.: A Critique of Present Methods in The Treatment of Infantile Paralysis.** *Am. J. Orth. Surg.*, 1916, xiv, 336.

The author is opposed to the application of braces except as a final step in the treatment of these conditions and when they have been improved to the fullest extent by the usual methods; in other words, not until the best results have been obtained which follow spontaneous recovery combined with those measures by which the patient's resources have been carefully safeguarded. This involves splinting and exercise under the direction of the best orthopedist available, and for a sufficient length of time to bring the patient up to the point where he is ready for results obtainable by modern methods of surgery.

Orr objects to the use of braces either as splints or as aids to locomotion, except for those patients whose disability is definitely established as permanent, or for those whom no other methods of improvement are possible or feasible.

PHILIP LEWIN.

**Rogers, M. H.: Operative Treatment of Infantile Paralysis.** *Am. J. Orth. Surg.*, 1916, xiv, 381.

The author bases his study on 130 cases, 79 of which were over 12 years of age and 51 under 12 years. The general policy was conservative. The author believes in operative interference in any case where a light brace is not sufficient and especially where there is developing an increasing deformity in spite of the brace. The type of case that needs attention is not always the flail-foot with complete paralysis, but the case that shows a paralysis of one group of muscles and a powerful antagonistic group. Rogers does not believe silk ligament fixation can permanently oppose a constant pull from a healthy muscle. Tendon-transplantation is more satisfactory.

In the cases of arthrodesis there were 50 per cent failures.

There has been noted at the Massachusetts General Hospital a gradual change of view away from arthrodesis toward astragalectomy. Each case offers a problem in itself and must be worked out individually.

PHILIP LEWIN.

**Taylor, R. F.: Operative Treatment of Infantile Paralysis.** *Am. J. Orth. Surg.*, 1916, xiv, 394.

It is the author's belief that tendon sutured to tendon is not so efficacious as tendon sutured to periosteum or bone, preferably at the insertion of the paralyzed tendon it is to replace. A muscle, to be transplanted and to functionate most successfully, must have its tendon pull in as straight a line as possible from its origin to its new insertion.

No silk extension is comparable in results to plan-



ning and effecting an operative procedure so that there is ample tendon to reach to the new insertion.

Adhesions in the transplanted tendon are to be avoided by carrying it through subcutaneous adipose tissue, through the sheaths of tendons that are to be replaced, or through septa in which non-closable foramina have been made by plastic flaps and by early electrical stimulation to prevent adhesions from forming. Several small skin incisions are preferable to two large ones. Subcuticular silver stitches are less likely to lead to adhesions.

The question of time when weight-bearing is to be permitted depends upon the severity of the original deformity, the strength of the transplanted tendon, and the security of the mechanical fixation by sutures, the possibility of early muscle training in active exercises, electricity, massage, etc. Weight-bearing should not be permitted sooner than 30 days, and then with some support.

Fine intestinal silk is preferable to catgut, kangaroo tendon, or heavy or paraffin-coated silk, in suturing the tendon accurately to the periosteum in the bone groove.

PHILIP LEWIN.

**Ryerson, E. W.: Methods of Stabilizing the Flail-Foot in Infantile Paralysis.** *Am. J. Orth. Surg.*, 1916, xiv, 387.

The author advises more frequent resort to astragalectomy in the feet which are very weak and in addition a fixation of the tendons by the Gallie operation slightly modified.

Whitman's operation of astragalectomy and backward displacement of the foot is of great value in the treatment of calcaneus deformities. Arthrodesis has a distinct field of usefulness in patients over fourteen years of age.

Silk ligament suspensions may have to be removed or the foot may relapse and it is extremely difficult to control lateral deviations of the foot by this means.

Ryerson was unable to get good results with the autogenous bone-peg, or dowel, driven through the lower end of the tibia, and through the astragalus and os calcis. For six months he used the Gallie method of inlaying the tendon in the groove gouged in the bone and in addition to this drilled a hole through the bone at the upper end of the groove. He then dissected up the proximal portion of the tendon, cut off as high as possible, passed it through the hole, and brought it down in loop-fashion to be sewed side by side to the portion lying in the groove.

PHILIP LEWIN.

**Anderson, W. L.: New Methods Used in the Study of Flat-Foot at Yale.** *Med. Times*, 1916, xlv, 144.

Methods of diagnosing static foot troubles and their correction as carried out at Yale University are given by the examiner, the author.

There has been added to the equipment of the medical office the most modern form of apparatus for making a diagnosis of faulty foot conditions.

This apparatus consists of a wooden table 36 inches high with a top surface 20 x 26 x 2 inches, in which is sunk a 13 x 13 x .25-inch plate glass section. Seven inches below and fastened by hinges to the rear legs of the table is a 13 x 22-inch German silver reflecting mirror, which can be adjusted at varying angles from 30 to 45 degrees to the plate glass in the top of the table. Clutches on either side of the frame holding the mirror enable it to be fixed at any one of these angles, which adds to the comfort of the examining physician. On the sides and fastened to the diagonally opposite legs are electric lights, with 15-watt frosted globes set in aluminum-lined reflectors so arranged that their rays are thrown directly upon the glass top. At a convenient distance in front of the table a long mirror, 20 x 54 inches, which is also adjustable, is placed so that the patient is able to see the bottom of his own feet as he stands upon the glass-topped table. In this way the physician as well as the patient has an exact picture of the actual degree of foot fault while the feet are maintaining the weight of the body, and photographs of the foot condition can be taken if desired.

R. B. COFIELD.

**Jones, R.: The Soldier's Foot and the Treatment of Common Deformities of the Foot.** *Brit. M. J.*, 1916, i, 782.

In the treatment of hammer-toe the author advises against amputation particularly if the affected toe is, as is usually the case, the second toe, for this removal is likely to cause the development of hallux valgus. Arthroplasty is not advised. The operation advised is a wedge-shaped excision removing the articular cartilage on both sides of the joint so as to definitely ankylose the joint in extension. An oval piece of skin, including the usually present corn, is excised and the flexor tendon is cut and the toe put up in extension on a little splint. This splint is worn for some weeks to insure ankylosis in the extended position.

In displacement of the little toe the displacement is similar to that of hallux valgus. Amputation is the treatment advised. A good-sized flap is necessary to overcome subsequent contracture. If a callus is present over the head of the metatarsal, walking with a shoe is not permitted until the callus has softened up and the skin becomes more nearly normal. Only very exceptionally should the head of the metatarsal be removed also, for this forms one of the points in supporting the foot on which a soldier's marching power depends.

Metatarsalgia is a peculiarly painful disability of the foot associated with flattening of the transverse arch. Immediate relief, Jones says, can nearly always be given by removing the pressure of the body weight off the heads of the metatarsal bones by a bar behind them, placed transversely across the sole of the shoe bringing the weight-bearing on the neck of the metatarsals. The inner side of the heel of the shoe should be raised one-third of an inch, and a band of strapping placed around the

transverse arch of the foot. In cases of longer standing not responding to this treatment, the head of the metatarsal, usually the fourth, should be removed. The same type of shoe should be employed as after-treatment.

Painful conditions about the heel may be due to (1) injuries or strains about the insertion of the tendo achillis, (2) spurs of bone and adventitious bursæ under the os calcis, (3) osteitis and periostitis from direct injury of the os calcis.

For Group 1 the method of "pin-firing" used by the farrier is advised in the more obstinate cases where rest and elevation of the heel three-fourths of

an inch does not relieve. This condition may be due to inflammation of the bursæ or strain on the insertion, but in both cases the treatment outlined is the same. A band of strapping placed just above the malleoli is beneficial.

In Group 2 Jones advises an incision along the inner margin of the heel and the removal of the spur and the adventitious bursæ.

In Group 3 the osteitis and periostitis may be slight and rest usually cures these, but if they are associated with a gross fracture of the os calcis or astragalus of any severity the soldier will not again be fit for service.

M. S. HENDERSON.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Graves, J. C., Jr.: Backache from the Viewpoint of the Orthopedist.** *Northwest Med.*, 1916, xv, 166.

The author presents some definite suggestions as to the various causes of backache as they are coming to be understood by the orthopedic surgeon.

Anatomic peculiarities of form, together with imperfect adjustment of the parts, are two of the most important factors in backache. There are also definite pathologic conditions which may be present separately or in conjunction with the variations of form or adjustments, such as the hypertrophic form of arthritis, which is apparently due to disturbance of the metabolism, the localization of the symptoms being due to some form of trauma. Infectious arthritis is another common form of disease frequently associated with backache. Apparently any of the infectious organisms may at times lead to joint symptoms.

R. B. COFIELD.

**Elmer, W. G.: The Handling of Children with Tuberculosis of the Spine While They Are Under the Influence of an Anæsthetic.** *Ann. Surg.*, Phila., 1916, lxiv, 34.

The author cites two cases from his own experience, which show how important the self-protection offered by the muscular system is in cases of tuberculosis of the spine. In children, especially, the relaxation of the patient under a general anæsthetic makes it very easy by slight torsion, by stretching, or by increasing the kyphosis to do great permanent damage. In one of the author's cases, he believes that tuberculous material was forced into the spinal canal. In the second case, in attempting to push the child further down on the table the spine was buckled like a hinge.

Since it has been shown that children bear bone-grafting into the spine very well, and that the results are very satisfactory, great care should be taken to prevent such accidents as the above, as very little violence is required in this type of cases. The author suggests the application of a cast on the day preceding the operation. This cast is split on both sides in the midaxillary line, and the following day

the child may be placed upon the table and the anterior half removed. After it is thoroughly anæsthetized, it may be turned to the prone position, without danger of injury to the spine, and the posterior part of the cast removed. At the end of the operation, the cast may be reapplied very quickly and fastened with strips of adhesive plaster.

GATEWOOD.

**Hatch, E. S.: The Treatment of Scoliosis.** *South. M. J.*, 1916, ix, 627.

The author gives Bradford and Lovett's classification as to the etiology of scoliosis. Those cases due to empyema, split vertebræ, or marked structural scoliosis without bone pathologic lesions give poor prognosis.

The author believes Abbott's treatment has now become the recognized method in scoliosis and that it is one of the greatest advances in mechanical surgery ever presented.

The conclusions reached are as follows:

1. The Abbott method of treatment gives far better results than any other method used, either in the past or the present.

2. The technique is a complicated one and there are very few men who put on the jacket as Abbott teaches even though they use his frame.

3. It takes from three to six corrective jackets to effect a cure, each jacket being worn about seven weeks, or as long as one can further correct the position by the application of the felt pads.

4. While we strive to overcorrect our cases it is not always possible to do so, but in practically every case the children can be placed in a nearly normal position.

5. After the patients are corrected, exercises are used daily for many months. These must at first be given by a competent instructor and later carried on at home. If the patients do not carry out the exercise treatment they will gradually relapse.

6. In a warm climate it is often wise to put on a thin extension jacket for the summer and start the correction from that point again in the fall.

H. W. MEYERDING.



## MISCELLANEOUS

## CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSSES, ETC.

**Hazen, H. H.:** Cases Illustrating the Faulty Treatment of Superficial Malignancy. *J. Am. M. Ass.*, 1916, lxvi, 1829.

During the past three years the author has been consulted by 32 private patients for malignant conditions of either the skin or mucous membrane of the mouth. Of this number only 6 consulted him for early, untreated stages of cancer. One of these had a cancer on the under surface of the tongue, while the remainder had cancer of the face.

The faults in handling the other cases naturally group themselves under three headings: (1) neglect on the part of the patient; (2) faulty diagnosis on the part of the physician; and (3) improper or insufficient treatment by either physicians or quacks. In 9 instances patients had neglected themselves without seeking medical advice. In this series there were 6 cases that had been wrongly diagnosed by the attending physicians, and 12 cases were either improperly or insufficiently treated after a correct diagnosis was made. In several instances more than one faulty method of treatment was employed: 4 cases had been treated by caustics; 5 patients had operations performed from which rapid recurrences took place. One small basal-cell lesion of the cheek had been treated by fulguration, with a recurrence in nine months, the recurrence being both deep and wide. Four of the patients had been treated by small divided doses of roentgen rays. (The new method of single dose therapy had been in use such a short time that we have not as yet had a chance to study recurrences after it, although some will doubtless occur.)

Special interest attaches to a series of 4 cases which were treated by the much vaunted radium, all of the patients being made much worse. The conclusions are:

1. The public is not yet sufficiently educated as to the importance of attending to superficial sores that will not heal.
2. While it must be admitted that some cases of superficial malignancy are difficult to diagnose, still entirely too many of them are mistaken for other affections, even by experienced physicians. All suspicious growths should be positively diagnosed at once.
3. Many cases are not treated radically enough. It should always be remembered that insufficient treatment of whatever kind is the worst possible thing for a patient suffering from a malignant condition.
4. Radium, even in large doses, and when administered by some of its greatest advocates, is by no means infallible in the superficial cases that it is believed to cure.

EDWARD L. CORNELL.

**McCouch, G. P., and Ludlum, S. D. W.:** Is Myopathy Related to Disorders of Internal Secretions? *Med. Rec.*, 1916, lxxxix, 1042.

Myotonia congenita and myasthenia are frequently associated with muscular dystrophy. Amyotonia congenita is said to have occurred in connection with muscular dystrophy and may be identical with one form of it. There is some evidence suggesting that thyroparathyroid deficiency may bear an etiological relation to myotonia. Myasthenia is frequently associated with hyperthyroidism, hypo-adrenalism, and probably with hyperactivity of the thymus. Hypothyroidism and pathological findings suggesting both hypo- and hyperactivity of the thymus are sometimes found in amyotonia. Myopathy is found in association with many disorders of internal secretion, perhaps most frequently with hypopituitarism. The case reported by the authors combines the adiposity, the deficient development of both primary and secondary sexual characteristics, the small hands with tapering fingers and the enlarged sella turcica of dystrophia adiposo genitalis with the distribution of atrophy and pseudohypertrophy, proportional muscular weakness, diminution and in some cases total loss of tendon reflexes, and the diminished response to electrical stimuli without reactions of degeneration characteristic of the fascio-scapulohumeral type of progressive muscular dystrophy.

Abderhalden tests on a series of four cases of myopathy, one case that may be either myopathy or spinal muscular atrophy, one case of neuritic muscular atrophy (peroneal type), and two cases of muscular atrophy from syphilitic root neuritis showed hyperactivity of thyroid, thymus, and adrenal in the first three conditions. In the peroneal case hyperactivity of the testis was also noted. The tests on the syphilitic cases were negative. Thyroid and thymus hyperfunction are frequently observed in hypopituitarism.

Whether the glandular disorders bear an etiological relation to myopathy or are secondary to it, or whether both are due to a common cause is uncertain; but the combination is too frequent to be regarded as a mere coincidence.

## SERA, VACCINES, AND FERMENTS

**Fox, H. H.:** Vaccine Therapy and Other Treatment in Acne Vulgaris and Furunculosis. *J. Am. M. Ass.*, 1916, lxvi, 2064.

A study of the examination records of the entering students at Cornell University showed that 30.2 per cent of the freshmen class suffered from acne vulgaris. Of this proportion, the distribution of the lesions in 17.8 per cent was general and in 12.2 per cent of the cases it was limited to the facial region.

In order to ascertain just what results could be expected from the different forms of therapeusis, and more especially to try out the efficacy of vaccine therapy, an analysis of 100 unselected cases of these two forms of pyogenic dermatoses was undertaken.

The cases were all considered chronic, in that they were all of six months' duration, and no case was included in which the eruption could possibly be ascribed to drugs, to occupation, or to syphilis. No attempt was made to study the bacterial etiology of either condition, except in so far as was necessary for the preparation of the autogenous vaccines, since that has been so well worked out by previous investigations, and also because ordinarily the stock vaccines are prescribed on the basis of a clinical diagnosis.

All the patients studied were instructed, before beginning treatment, to avoid such foods as seemed to disagree with them, not to eat to excess, to eat slowly and at regular intervals, to drink plenty of water, especially on rising in the morning, to see that the organs of elimination were functioning normally, or if they were not to consult the physician in charge before resorting to medical correctives. Locally, they were to remove the comedones by gentle massage, after first having relaxed the skin by applications of towels wrung out in hot water. Following the removal of the blackheads, they were to apply to the face towels wrung out of cold water in order to tone up the skin and cause a diminution in the size of the pores.

In the tables given the most striking point, and one not generally brought out by writers on the subject, was the fact that in the 74 cases of acne treated not one of the cases developed in a student engaged in athletics. The author does not mean to imply that acne has never occurred in athletes, but he wishes to point out that the table shows the great part athletics plays in the prevention of acne. On the other hand, however, nine cases of furunculosis, out of a total of 26, occurred among students engaged in athletics. These cases were due to direct infection and, without exception, occurred among the wrestlers and crew men, the location of the lesion being typical of the cause of the trouble.

Dietetic errors and digestive disturbances accounted for from one-third to one-half the cases in each group. Comedones were not found so frequently as many writers would lead one to expect. A majority of the cases in each group were sporadic, but of those influenced by seasonal variation, the larger number of cases occurred in the summer. The cases of acne showed longer average duration than the cases of furunculosis, the period of duration being from three to four years of acne, for furunculosis six months to one year. It is interesting to note that although of the entire freshman class the larger percentage of the cases of acne were of general distribution, over twice the number of students who applied for treatment did so for the facial type of acne.

Under the heading local treatment were included all applications made directly to the eruptions. In some instances this meant ointments or lotions; in others, particularly the coarse pustular type, and especially in furunculosis, local treatment included evacuating the pus by free incisions and applications of wet dressings. Combined treatment included those cases in which the patient received the vaccines in conjunction with the local treatment. Medical treatment included cases in which the patient was treated only by medicines taken internally, such as calcium sulphide and cod liver oil.

A study of the patients treated by vaccines shows that not one patient with acne seen three months or more after cessation of treatment was cured by autogenous vaccine; on the other hand, autogenous vaccines were credited with causing permanent improvement in 25 per cent and stock vaccine in 18 per cent of the cases. The coarse type of acne comprised cases in which the diameter of the majority of the lesions exceeded a pin head in size; 22.8 per cent of these patients were permanently improved, 2.8 per cent cured. The fine type, or those in which the majority of the lesions were pin head or less in diameter, exhibited but 5.5 per cent of the patients improved, none cured.

The investigation would seem to demonstrate, first, the important part played by personal hygiene in the cause, prevention, and treatment of acne vulgaris and furunculosis; second, the superiority of well-known therapeutic measures over vaccine therapy in the conditions studied; and, third, the value of following up the cases to ascertain the number of permanent improvements, since experience has shown that the results attained during the time of treatment are no criteria of the changes to be seen in the eruption at a later date.

EDWARD L. CORNELL.

## BLOOD

**Marriott, W. M.: A Method for the Determination of the Alkali Reserve of the Blood-Plasma.**  
*Arch. Int. Med.*, 1916, xvii, 840.

Marriott points out that bicarbonates, alkali protein compounds, and small quantities of alkali phosphates together constitute the alkali reserve of the blood-plasma, and that under normal conditions these substances are present in very constant quantities. A diminution in the alkali reserve is known as acidosis and may be recognized by a variety of clinical symptoms and by characteristic alterations in the composition of the blood, urine, and alveolar air.

The alkali reserve maintains the plasma at a constant slightly alkaline reaction, despite the fact that acid products of metabolism are continually being poured into the blood. Chief among the acid products, so far as total quantity is concerned, is carbonic acid. This, as carbon dioxide, enters the plasma circulating through the tissues and is taken up partly in combination and partly as dissolved carbonic



acid. An almost infinitesimal change in reaction in the direction of acidity occurs. The slight change is sufficient to stimulate the respiratory center. The resultant pulmonary ventilation removes the excess of carbon dioxide and the plasma reaction returns to its original point. An excessive production of carbon dioxide in the tissues results in a greater change in the reaction of the plasma, with a consequent increased stimulation of the respiratory center and increased pulmonary ventilation. This tends to accomplish the removal of the extra carbonic acid. No depletion of the alkali reserve occurs.

The author carried out a series of experiments on a large number of normal individuals and the method he employed consisted in dialyzing serum or whole blood against salt solution in order to remove coloring matters and proteins. The hydrogen ion concentration of the dialysate was determined by means of the indicator, phenolsulphonephthalein, phosphate solutions of known hydrogen ion concentration being used as standards for comparison. At the outset of this work it was realized that the actual hydrogen ion concentration was not determined; the results, however, coincided closely with those obtained by the electrical method. In severe acidosis variations in the direction of acidity were encountered. The method seemed to indicate variations in the hydrogen ion concentration, although the variations observed were probably greater than those actually occurring.

Also a series of cases exhibiting clinical or laboratory evidences of acidosis was studied. These cases included nephritis and diabetes in adults, and nephritis, recurrent and idiopathic acetonæmia, and severe diarrhœa in children, and the results are recorded in detail.

Briefly Marriott summarizes his paper as follows:

1. Acidosis implies a diminution of the alkali reserve of the blood-plasma, though not necessarily a change in its hydrogen ion concentration.

2. A simple and rapid method for the measurement of the alkali reserve is described. It is a modification of the indicator dialysis method for the determination of hydrogen ion concentration, but is more accurate and gives more information than that method.

3. The method serves for the detection and accurate quantitative estimation of the degree of acidosis.

The results obtained in twenty-five cases of acidosis are reported.

GEORGE E. BEILBY.

**Leopold, J. S., and Bernhard, A.: The Non-Protein Nitrogenous Constituents of the Blood and the Phenolsulphonephthalein Test in Children.** *Am. J. Dis. Child.*, 1916, xi, 432.

The authors report the results of the examination of the blood of 50 children free from renal disease and of 16 children suffering from renal disease.

In every instance the amount of the total non-protein nitrogen, of the urea nitrogen, of the uric

acid, and of the creatinin was determined. In the children free from renal disease the average of the total non-protein nitrogen was 28 mg. per 100 ccm. of blood; the average of the urea was 12 mg. per 100 ccm.; the uric acid average was 1.3 mg. per 100 ccm.; the creatinin average was 1.5 mg. per 100 ccm.; and the average phenolsulphonephthalein excretion was 70 per cent.

Cases suffering from some renal affection were divided into four groups: acute nephritis, chronic nephritis, passive congestion, and one case of sarcoma. The phenolsulphonephthalein excretion was diminished in each condition, while the non-protein nitrogen constituents were increased only in chronic nephritis, being within normal limits in acute nephritis and in passive congestion. In the case of sarcoma of the kidney the non-protein constituents were normal with the exception of the uric acid which was increased.

From a study of their findings, the authors concluded (1) that in children the blood content of the non-protein nitrogenous constituents is normally practically identical with that of the adult; (2) that the variations under conditions of kidney affections correspond with those changes observed in adults under similar conditions; and (3) that the determination of the non-protein nitrogen in the blood of children will prove as valuable a help in diagnosis and prognosis in children as it has in adults.

J. W. TURNER.

**Goodman, C., and Bernstein, E. P.: Presenile Gangrene-Thrombo-Angiitis Obliterans.** *N. Y. M. J.*, 1916, cii, 1073.

The authors, who believe the etiological factor of thrombo-angiitis obliterans to be an infectious agent, report 21 cases in which serological studies were made with regard to typhus fever.

They call attention to the fact that thrombo-angiitis obliterans is more prevalent in those countries where typhus fever is epidemic and they suggest the possibility of the specific micro-organism of typhus fever being the etiological factor of thrombo-angiitis obliterans.

The agglutination reactions and complement-fixation tests upon the 21 cases were made according to the methods described by Olitsky. In 18 cases the reactions were negative; in 3 cases the reactions were marked, one showing almost complete agglutination in a dilution of 1:200 and two in a dilution of 1:400.

The positive reactions were given great weight because 102 controlled cases gave a negative reaction and because, in many instances, the serological reactions of typhus patients may become negative within so short a period as five months from the termination of the disease.

J. W. TURNER.

**Birtch, F. W.: Twenty-seven Transfusions at St. Luke's Hospital.** *Calif. St. J. Med.*, 1916, xiv, 240.

In this series, the method has been direct transfusion, a radial artery being connected to a super-

ficial vein by means of a Brewer or Pope tube. The time during which the blood was permitted to flow has varied greatly, depending upon the size of the tube used, the donor's blood-pressure, his heart-rate, the physical condition of the recipient, and the symptoms which developed during the procedure.

The hæmoglobin of the patients has been frequently recorded during the process of the transfusion and has been found to increase from 10 to 40 per cent while they were on the table. If no subsequent bleeding occurs the hæmoglobin is generally from 5 to 20 per cent higher on the following day.

In none of this series has any of the surgical accidents occurred, such as embolus, local infection, hæmolysis, or over-transfusion with its train of symptoms, or cardiac dilatation, œdema of the lungs, tender, tense abdomen, enlargement of the liver and spleen, and rupture of the abdominal viscera. In 3 cases, immediately after transfusion the patient developed a severe chill and high temperature. The temperature, however, subsided in about twelve hours.

Where the time would permit, the examination of donors consisted in taking the history, physical examination, Wassermann reaction, hæmolytic tests and blood examination, with particular reference to leucocytosis, lymphocytosis, eosinophilia, parasites, etc. It was not possible to make all of these examinations in nine of the emergency cases. Under these conditions relatives of the patients were always used as donors and no harmful results were observed from the transfusions. In one case the blood transfused was from the patient's son, and had previously been tested in the ordinary way; yet this patient developed the most marked reaction in the form of a chill and fever of any of the series.

The cases transfused to minimize surgical risk were quite satisfactory. The cases transfused for diseases of the blood, although showing slight benefit, were on the whole unsatisfactory. Cases transfused for shock demonstrated the value of this procedure.

The author believes that there is no excuse for a surgeon permitting his patient to die from shock or hæmorrhage without giving him the advantages of transfusion. Transfusion should be looked upon not only as a method for reviving moribund cases with hæmorrhage and shock, but also as the best prophylactic in preventing these conditions in individuals who are anæmic, depleted, and weakened by disease. Many after transfusion are enabled to withstand major surgery. ALBERT EHRENFRIED.

#### BLOOD AND LYMPH VESSELS

**Villavicencio: Treatment of Accessible Arterial Aneurisms** (Nota sobre el tratamiento de los aneurismas arteriales accesibles). *Gac. méd. de Caracas*, 1916, xxiii, 64.

The author discusses the comparative merits of ligature and radical extirpation. He refers to six cases which he operated upon. Two cases of aneur-

ism of the carotid treated by ligature and 4 cases of aneurisms in the limbs treated by extirpation; i.e., one of the superficial femoral, one of the popliteal, one inguinal, and one axillar.

The two carotid aneurisms recovered perfectly without complication. In the femoral aneurisms, gangrene developed and the patient died. The other three limb aneurisms recovered perfectly, but complete and radical extirpation of the aneurism alone was extremely difficult on account of adhesions, etc.

The author believes that the radical cure of accessible arterial aneurisms ought always to be the method of choice, unless there are special contra-indications.

W. A. BRENNAN.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Sibley, W. K.: The Treatment of Scars.** *Practitioner*, Lond., 1916, xcvi, 637.

The most frequent causes of scars are injuries, surgical operations, burns, tuberculous and other ulcerating skin diseases, acne, and variola. Scar tissue, because of its avascularity, is not affected by drugs taken internally, but may be locally influenced by physical and electrical agents.

1. Hyperæmia with Bier's suction cups will improve depressed, irregular, and adherent scars and tend to convert avascular into vascular tissue. Scarring from both acne and smallpox is benefited by this treatment. Other methods of increasing hyperæmia are the use of radiant heat, moist or dry hot air and hot or cold compresses, all of which are serviceable for the relief of pain and for the production of hyperæmia.

2. Massage is most useful in freeing adherent scars from deeper structures.

3. Desquamating agents, such as salicylic acid or resorcin from 5 to 30 per cent strength, may be used to smooth down raised scars.

4. Electrical treatments, of which there are several forms, often give satisfactory results. By means of ionization soluble drugs are driven into the scar tissue. Sodium chloride, sodium salicylate, and iodine are the drugs used. Small repeated doses of X-rays may be cautiously used on hypertrophic scars, especially if they are keloid in nature. Radium also causes scars to become smooth and movable and relieves pain. High-frequency currents may be given locally or generally. Galvanism restores the tone of adjacent muscles and thus increases movement of the parts.

5. Of drugs used locally there are two: (1) fibrolysin, which consists of a 15 per cent solution of combined thiosinamine and sodium salicylate, 40 minims of which may be injected every two or three days into the gluteal region or around the affected tissue, and (2) cicatricine (thiosinamine and antipyrine) which is stated to be non-toxic and non-irritating, the dose for injection being from 8 to 17 minims.

E. K. ARMSTRONG.



## EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Dubois, E. F.: Metabolism in Exophthalmic Goiter.** *Arch. Int. Med.*, 1916, xvii, 915.

In contrast with the symptoms on the part of the nervous system, the heart and eye symptoms, which vary greatly in this disease, an increased basal metabolism was found by Dubois with great regularity in exophthalmic goiter, which in severe cases, he states, reaches a level found in no other condition. On the other hand, in cretinism and myxœdema he found the metabolism lower than in any other diseases. The administration of thyroid extract, particularly in myxœdema, raises the heat production. All other diseases in which metabolism is increased are easily distinguishable from exophthalmic goiter, and they never approach the extremes found in this condition. The basal metabolism is higher than normal in youth, in fever, in lymphatic leukæmia, and in pernicious anæmia, in severe cardiac disease, and in some cases of severe diabetes and cancer. It is lower than normal in old age, and in some wasting diseases, and perhaps in some cases of obesity. Diseases of the ductless glands other than thyroid show in some cases an increase, in some a decrease, but these are comparatively small.

From the author's experiments and observations in a large series of cases he was able to make the following summary of his work:

The metabolism in exophthalmic goiter has been studied for the first time in a respiratory apparatus which is also a calorimeter. Thirty-seven observations were made on eleven patients with this disease, and six experiments were made on a cretin. With some of the patients the nitrogen balance was also studied.

The measurement of the heat production gives the best index of the severity of the diseases, and of the effect of treatment. Very severe cases show an increase of 75 per cent or more above the normal average, severe cases 50 per cent or more, and moderately severe and mild cases less than 50 per cent, while a few mild and several atypical cases or those in which operation has been performed may be within normal limits. In severe cases the warmth of the skin and sweating can be accounted for entirely by the necessity for the increased elimination of heat. At least a part of the tachycardia is due to the increased metabolism, and perhaps it might be possible to reproduce the extreme tachycardia, the cardiac enlargement, emaciation, and mental irritability if it were possible to stimulate the metabolism of normal men for twenty-four hours a day over a period of months or years.

The specific dynamic action of protein and of glucose is within normal limits, and there is no consistent difference between the effects of protein in meat and an equal amount in milk and eggs. One patient was able to derive 89 per cent of his calories from carbohydrate in an experiment when he was

showing an alimentary glycosuria. There is evidently no interference with the oxydation of carbohydrates.

The methods of direct and indirect calorimetry agree very closely when the technical difficulties are considered. The method of direct calorimetry gave results which were slightly lower than the indirect, the total difference being 2.9 per cent, the average difference in the individual being 4.1 per cent. This and the absence of abnormal respiratory quotients show that the law of the conservation of energy holds good in exophthalmic goiter, and that there is no profound disturbance of the intermediary metabolism.

The average water elimination through the skin and lungs in the severe and moderately severe cases of hyperthyroidism is 39.9 grams per hour. The increase above the normal is closely proportional to the increase in heat production; 25.7 per cent of the calories are dissipated through vaporization in goiter patients, whereas the mean normal is almost the same, 23.9 per cent.

The level of the heat production was used as an index of the effect of medical treatment. Rest in bed for a week or more caused a drop of more than 10 per cent. The effects of treatment with Beebe's serum, thyroid "residue," ergotin, and quinine hydrobromate was less marked, each being tested on one patient. Ligation of the thyroid arteries with three out of the four patients studied caused a distinct rise in metabolism, the duration of which was uncertain. There is as yet no proof, the author states, that any conservative form of treatment causes a greater reduction of metabolism than mental and physical rest.

One small cretin 36 years old produced about half the calories eliminated by children of his size. As estimated by the surface area, his metabolism was about 20 per cent below the normal adult level. Three and a half days' treatment with thyroid extract raised his heat production to normal.

GEORGE E. BEILBY.

**Dewey, K.: Experimental Hypercholesterolaemia.** *Arch. Int. Med.*, 1916, xvii, 757.

The author has made use of a watery colloid emulsion of cholesterol for intraperitoneal injections in rabbits and guinea pigs. Instead of Merck's pure cholesterol he used a preparation obtained from gall-stones by extraction with ether in the Soxhlet apparatus. For the separation of all saponifiable substances from this ether extract, a method was employed which is based largely on Kumagawa and Sutro. Five grams of the dried ether extract were dissolved in 350 to 400 ccm. of petroleum ether; to this 70 ccm. of a 1 per cent absolute alcoholic solution of potassium hydroxide and 30 ccm. of distilled water were added. The mixture was shaken and the ether solution of cholesterol separated from the alcoholic solution of soaps in the separating funnel. The petroleum ether was evaporated and the dry cholesterol treated in the same manner a



second, and if necessary, a third time. Finally it was recrystallized with alcohol. The melting point of this preparation was between 146 and 147° C. (294.8 and 296.6° F.).

The experiment consisted of intraperitoneal or intravenous injections of emulsions of cholesterol into twelve rabbits. Control animals received injections of distilled water from which the added acetone was evaporated. The author found it possible, for example, to make thirty injections in daily succession into the veins of the ears of one rabbit. After intraperitoneal injections, cholesterol deposits in small nodules were generally found on the mesentery, liver, spleen, and the under surface of the diaphragm.

From the results in rabbits of the experimentally produced hypercholesterolaemia the author draws the following conclusions:

1. Very small quantities of cholesterol administered by intravenous injections, and relatively small amounts injected intraperitoneally are sufficient to produce pathologic conditions in some organs of the rabbit.

2. In intermittent hypercholesterolaemia, such as is produced by periodical intravenous injections of small doses, the extent of the cholesterol infiltration and other pathological conditions are entirely out of proportion to the amount of cholesterol injected.

3. Unfiltered emulsions, that is, those in which the colloid particles are heterogeneous in size, and emulsions of high concentration have a violent destructive effect on the structures of the liver.

4. Cholesterol deposits in cells other than those normally and physiologically rich in this liquid substance are not a simple infiltration, but constitute an injury to the function of the cells and signify degenerative processes.

5. Pregnancy seems to furnish conditions which favor the infiltration of certain organs with cholesterol, from whatever source it may be derived. Rabbit II, which received only 2 gm. of cholesterol in 108 days by the intermittent method, and which was pregnant twice during this time, had, of all the animals, the most marked cholesterol infiltration and other pathological conditions in the liver and kidney.

In a summary of the results of his investigation the author states that in experimental hypercholesterolaemia the effects vary, not only according to the kind, size, and number of the doses, but also greatly according to the general condition of the rabbit, individual as well as physiological and pathological. The amount of cholesterol seems less essential than the degree of constitutional integrity and functional activity of the cell which prevails prior to the injection, or which results from the first establishment of an experimental hypercholesterolaemia.

The ready infiltration in the liver of the rabbit, in contrast to that of carnivora, is an expression of insufficiency on the part of an organ which has nor-

mally a light task to perform in the cholesterol metabolism.

As a result of hypercholesterolaemia gall-stones may be formed in sterile bile without infection or injury of the gall-bladder. Their formation is preceded by desquamation of the epithelial cells, due to the irritating action of an excess of cholesterol.

Cholesterol injected into the circulation of rabbits is not accumulated in the blood to any great extent, but is rapidly deposited in various organs, while the elimination of it through the bile and urine is also greatly increased.

The focal infiltration of the kidney with cholesterol which occurs in hypercholesterolaemia is accompanied by degenerative processes of the parenchymatous structures. The urine, as a rule, contains appreciable amounts of cholesterol.

GEORGE E. BEILBY.

**Celler, H. L., and Thalhimer, W.: Bacteriological and Experimental Studies on Gastric Ulcer.**  
*J. Exp. Med.*, 1916, xxiii, 791.

Many investigators have attempted to produce chronic ulcers experimentally. These experiments have been performed on various species of animals, and a great variety of methods has been used in causing the original injury to, or defect in, the gastric mucosa. All these attempts have failed, and the continuity of the gastric mucosa was always restored by prompt healing unless the procedure caused a complete stoppage of the blood supply to a part of the stomach. This was followed in some instances by infraction and by perforation and its sequelae.

Recently Rosenow has published some interesting investigations on the production of acute and chronic gastric ulcers in rabbits and dogs. His full report has not yet appeared. He isolated anhaemolytic streptococci, so called streptococcus viridans or mitis, from 96 per cent of a series of gastric ulcers removed from human subjects at operation. Recently isolated cultures were injected intravenously into animals, and in 60 per cent gastric ulcers were found. In a few animals which were allowed to live for a considerable time after their inoculation, in some instances several months, chronic ulcers were found at autopsy. From these results Rosenow has reached certain conclusions which may be briefly summarized as follows:

1. Anhaemolytic streptococci can be recovered by a special technique from practically all gastric ulcers removed at operation.

2. The streptococci from this source possess a specific affinity for the stomach which enables them to localize in this organ, when recently isolated cultures are injected intravenously into animals.

3. About 60 per cent of the animals inoculated in this manner develop gastric ulcers. Other lesions also occur following these inoculations, but with less frequency.

4. Streptococci can be recovered from these experimental ulcers and can be demonstrated his-



tologically. They reach this location by the blood stream and are deposited in the capillaries of the gastric mucosa.

5. These streptococci are identical with those inoculated.

6. Anhæmolytic streptococci are, therefore, the cause of gastric ulcers in man, and these organisms reach the stomach by a hæmatogenous route.

The following experiments were undertaken following Rosenow's presentation of his investigations. The technique which the authors employed in isolating and injecting the streptococci is identical with Rosenow's. The material studied consisted of eight chronic gastric ulcers which were removed at operation from human subjects and examined bacteriologically and histologically. They also studied one ulcer occurring at the ostium of a gastrojejunostomy. The results obtained from these examinations and the animal experiments performed with the organisms recovered from these ulcers form the basis of the authors' report. They state that although the number of specimens studied has not been large, the consistency of the results obtained by all three methods of investigation justifies the present communication.

As a result of their studies they are unable to determine definitely whether or not the gastric lesions produced by the injection of streptococci are to be considered ulcers. The superficiality of the rabbit lesions following the injection by the intravenous route as well as the entire absence of inflammatory reaction in the deeper gastric tissues leads the authors to believe that these defects are certainly not analogous to the chronic gastric ulcer seen in the human stomach. The promptness of healing of the embolic lesions in the cats tends to strengthen this conclusion.

The constant presence of an anhæmolytic streptococcus in human gastric ulcers might be adduced as an argument in favor of the part played by this organism as the cause of the chronicity of the lesion. If streptococci could be demonstrated in considerable numbers in the depth of human gastric ulcer this conception would gain a firmer basis. Rosenow has found streptococci in all the coats of the stomach, some of the organisms even lying just beneath the serosa. No mention is made of the number of organisms in this position. In the authors' series of ulcers, however, despite the examination of many sections, the streptococci were found only on or beneath the surface of the defect.

Briefly, they conclude that it must be assumed that some cause is operative in certain cases preventing the healing of defects in the gastric mucosa and is inoperative in others. Even though anhæmolytic streptococci are present in practically all gastric ulcers, the authors cannot convince themselves that these organisms have been proven as yet to be the factor which either initiates the ulceration or prevents healing. Nevertheless, the constant presence of streptococci in this type of lesion

is a suggestive fact and further experiments to determine their significance are being undertaken.

GEORGE E. BEILBY.

**Bolognese, G.: Experimental Renal Sporotrichosis** (*Sporotrichosi renale sperimentale*). *Policlin*, Roma, 1916, xxiii, sez. chir., 129.

Clinical research has proved that the sporotrichia like other mycoses may locate in the various animal and human viscera. The author has selected the kidney for the purpose of instituting systematic research into the histopathologic nodality of the infective process. The method selected was direct inoculation of the sporotrichium (*Beurmann* variety) in the renal parenchyma of rabbits. Ten animals were inoculated, in all of which the author got results; two were controls.

All the animals survived the experiments and with no notable signs of detriment. They were generally killed between the eighteenth and fortieth day and the kidney removed for examination. Reviewing these results the author finds that direct inoculation of sporotrichium in the renal tissue of rabbits is compatible with life. Retrogressive lesions are produced at first, sanguinary extravasation, hyperæmia, and degeneration of the parenchymal elements of the kidney. Later there is observed interstitial granular necrosis, calcareous renal infarcts, hyaline degeneration, etc., the lesions becoming progressive and nodular in character. The author considers that these anatomopathologic alterations observed are evidently those of an infective tumor corresponding in character to a granuloma.

In the interior of the nodules new blood-vessels are not observed. They are observed in the older connective tissue surrounding the nodules. In one case only was a localization of the granuloma observed outside the kidney; i.e., a ureteric nodule and a similar one in the muscular walls. The neoform connective tissue is frequently very rich in giant-cells and is especially capable of rapid and progressive proliferation. The author checked his results by a series of control experiments.

W. A. BRENNAN.

**Baitsell, G. A.: The Origin and Structure of Fibrous Tissue Formed in Wound Healing.** *J. Exp. Med.*, 1916, xxiii, 739.

The author gives the results obtained from an extensive series of experiments undertaken for the purpose of studying the action and fate of the fibrin-clot formed during wound healing. It is shown that in the healing of skin wounds in the frog a definite transformation of the fibrin-clot takes place similar to that which was found to occur in the tissue cultures. This transformation also results in the formation of a new fibrous tissue, without intracellular action, which is apparently identical with regular permanent connective tissue.

It seemed best to Baitsell to carry on the experiments in wound healing with the frog inasmuch as the tissues used in the previous work with living



tissue cultures had been obtained from this animal. During the present experiments 31 animals were used and a total of 50 operations were performed. The process of wound healing was studied at various stages both in the living animals and in the preserved material.

The experiments reported in the present paper demonstrate that in wounds made in the skin of adult frogs there occurs, as has previously been shown to be the case in living cultures of adult frog tissues, a direct transformation of the fibrin-clot into a new fibrous tissue without any intracellular action. This newly formed fibrous tissue which fills the wound space is apparently identical in appearance, structure, function, and staining reactions with regularly formed permanent connective tissue. It differs from adult connective tissue in the skin of the frog in its reaction with pancreatin digestion. However, this test, as well as all others that have so far been tried, fails to differentiate between the new fibrous tissue and young connective tissue found in tadpoles of various stages.

In experimental wounds, made by removing various sized pieces of skin from the frog, there is a rapid coagulation of the blood-plasma and lymph to form a coagulation tissue which fills the wound cavity.

Observations on living animals show that the coagulation tissue becomes more and more resistant and is generally of sufficient strength to hold the cut edges of the wound in place and to retain its position in the wound cavity. It serves, at least temporarily, as a connective tissue and as a base for the epithelial cells which rapidly move in from all the cut edges and cover the wound.

The study of the prepared sections of wound tissue show that at first in the coagulation tissue, formed as a result of the clotting of blood and lymph, a typical fibrin net is present in the wound. Later this fibrin net is transformed into a new fibrous tissue containing bundles of wavy fibers in which in many instances, the individual fibrils can be noted. This transformation of the clot and the formation of the new fibrous tissue takes place before the tissue-cells wander into the coagulation tissue and therefore cannot be due to an intracellular action. It is a direct transformation of the fibrin-clot and is identical with the process which was previously found to take place in the fibrin-clots in living cultures of adult frog tissues.

The tissue-cells, which later move into the new fibrous tissue in large numbers from the surrounding areas, do not digest the fibers but, apparently by their movements, cause a division of the large bundles into smaller ones. These cells when they first appear in the fibrous tissue are rounded, but later they assume the typical elongated spindle shape of fibroblast cells. The preparations do not show any connection between these spindle-shaped cells and the fibers which had already formed, nor is there any evidence of a later attempt by them to form new fibers intracellularly.

The staining reactions of the new fibrous tissue appear to be identical with the staining reactions of the connective tissue in frog skin. However, the new tissue can be digested in pancreatin and in this reaction it differs from the connective tissue in the skin of the adult frog. On the other hand, extensive experiments with pancreatin on embryonic but fully formed connective tissue obtained from the tail and skin of tadpoles of various ages, show that pancreatin will digest it just as it does the newly formed fibrous tissue.

GEORGE E. BEILBY.

**Adler, I.: Some Reactions of Blood-Vessels to Certain Chemicals.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 297.

Adler points out that the various tissues and organs of the body receive from the circulating blood such material as they require for their nutrition and function; they, on the other hand, must necessarily discharge some of the products of their metabolism into the interstitial tissue and its lymph-spaces. The blood-vessels are therefore likely to be steeped in media more or less unstable in their chemical composition and varying widely in different regions of the body; and it is to be assumed *a priori* that the vascular system reacts in certain definite ways to the physical and chemical changes that are more or less continuously taking place round about it. The study of the effects of chemical reagents, of the products of glandular secretion, of the action of drugs, upon the heart and the blood-vessels, especially upon the arteries, has been mainly carried out by methods of perfusion. The direct observation of the living vessels under varying mechanical, thermal, electrical, and chemical conditions has received comparatively little attention.

The author's experiments were done mainly on the frog, using principally the mesentery, and the reagents employed were dissolved in 0.75 per cent saline solution and applied by means of a small glass tube having a rubber bulb at one end and the other drawn out into a moderately fine capillary. He presents in detail the reaction observed by the use of alkalis, and of acid solutions.

Summing up his results the author seems to be fully conscious that there still remain sufficient problems that have not been solved and discrepancies that have not been reconciled. The curiously uneven and apparently irregular contraction of the vascular walls, which they call "beading," demands further investigation and explanation, he believes. The fact that cleansing the mesentery with filter or litmus paper in one instance causes no disturbance whatsoever, and that again violent constrictions may follow the same manipulation, though suggesting several plausible hypotheses, has not attained a precise explanation in his opinion. Similarly it has often been observed that acid solutions (alkaline not so frequently) had apparently no effect until the mesentery was washed with normal saline, when the constrictions promptly appeared. Here again, he states, several explanations suggest themselves, but



all these problems await further investigations. Nevertheless it is believed that certain conclusions may safely be drawn from his observations. They furnish a further corroboration of what may now be accepted as a fact, that "there is in the words of Bayliss, a complete chemical regulation of the cardiovascular system which may act independently from the central nervous system." It has been shown in this paper that it is not only the blood circulating in the blood-vessels that takes part in the regulation of their functions, but that the chemical conditions of the tissues and fluids surrounding the blood-vessels also exercise an important influence. It appears furthermore that it is not only the products of the internal secretions which are concerned in this, but that common acids and alkalies, the specific metabolites of the tissues and cells besides a number of neutral salts, under ordinary circumstances foreign to the organism, may exercise a controlling influence. Strong acids act like alkali in compelling vessels to contract. It is true that such extreme chemical changes as have been presented in this paper are not ordinarily likely to occur. Rowntree and his associates estimate the hydrogen-ion concentration of normal human blood-plasma as varying from  $\text{pH}=7.4-7.6$ ; of the blood serum from  $\text{pH}=7.6-7.8$ . In clinical acidosis  $\text{pH}=7.3-7.1$ , and in dogs just before death from experimental acidosis  $\text{pH}=6.9$ . Henderson has shown that the blood is able to dispose of considerable quantities of alkali or acid without much change in its reaction. There must necessarily however be a limit to this, and one may conclude from the observations recorded by the author that besides the chemical and physical reactions of the blood itself, there are other chemical and physical factors which, when once a certain limit has been overstepped, may lead to grave disturbances of circulation, and one can easily conceive of certain pathological processes such as inflammations, thromboses, necroses, and other local, possibly even systemic, affections originating in this manner.

GEORGE E. BEILBY.

**Auer, J., and Gates, F. L.: The Absorption of Adrenalin After Intratracheal Injection. *J. Exp. Med.*, 1916, xxiii, 757.**

In order to subject a living organism to the systematic action of any soluble substance, it is obvious that the substance must first reach the circulating fluids of this organism; from the lymph and blood streams the drug may then pass into the tissues and exert its effect. The main routes available for bringing any substance into contact with the tissues are as follows: (1) by introduction into the gastrointestinal canal; (2) by subcutaneous, intramuscular, untravenous, or intraspinal injection; (3) by incision through the skin, and (4) through the respiratory tract.

Auer and Gates' purpose in this paper has been to test the possibilities of the respiratory route, and they have submitted evidence of an experimental nature which shows that a simple intratracheal in-

jection of a solution in a normally breathing rabbit penetrates within a few seconds to the alveoli, chiefly those of the left lower lobe; that absorption is rapid and well maintained; and that the procedure may be repeated effectively a number of times even with a substance like adrenalin which decreases absorption. It was also shown that absorption of adrenalin from the lung could be obtained at a time when double the dose given intramuscularly exerted no blood-pressure effect whatever, and that absorption could still take place after the development of pulmonary oedema, when there was an undoubted dilution of the injection solution with a serum-containing liquid and when a diminution of the absorptive field had occurred.

The solution injected, after reaching the alveoli, is probably largely taken up by the capillaries of the pulmonary veins. This is indicated by the great rapidity with which an intratracheal injection of adrenalin may cause a rise of blood-pressure. In numerous instances, for example, the pressure began to rise less than five seconds after the completion of an injection, equaling, and even surpassing in rapidity of effect intramuscular injection. Absorption by the lymphatics probably plays a secondary part, an assumption rendered all the more likely when it is considered that lymph-nodes are interpolated in the lymphatic pulmonary path, where the bed of the lymph stream becomes greatly widened and the current slowed.

Injection into the lungs, however, offers another advantage due to the vascular arrangement of the absorbing field which could be of value therapeutically. Absorption of liquids injected into the lung probably takes place largely through the capillaries of the pulmonary veins; to a slight extent possibly through the capillaries of the bronchial veins which empty partly into the pulmonary veins, partly into the azygos veins, and probably some absorption occurs also through the lymphatics. By far the larger portion of the absorbed material will thus be rapidly delivered to the left auricle and then to the left ventricle. At each succeeding systole, as long as absorption continues, a fraction of the drug will be driven into the coronary arteries and be able to affect the musculature of the cardiac pump. This fact, the authors state, ought to render the procedure of intratracheal injection a valuable method when it becomes imperative to stimulate a suddenly failing heart as promptly as possible by drugs of the digitalis group.

Intratracheal injection is perhaps better under the conditions mentioned than the intravenous route, for the surface veins cannot always be entered with promptness and certainty, even under fairly normal conditions, and in cases of cardiac weakness the difficulties will be measurable increased, while an intratracheal injection can be carried out with ease. Moreover, the authors state, it is legitimate to expect that some absorption will take place from the lung alveoli as long as the heart-lung circulation persists, no matter how feebly, and that thus some



of the drug will reach the heart to act on this structure itself more promptly perhaps than when the drug is administered successfully through surface veins. As far as the intramuscular route is concerned, they have shown that the intratracheal injection of adrenalin gives prompt though diminished absorption at a time when double the dose intramuscularly exerts no blood-pressure effect whatever.

The technical difficulties of giving an intratracheal injection in animals are slight. Tracheotomy, as practiced by the authors in the present series of experiments, is not necessary, for the injection may be given into the intact trachea without exposure of the trachea. The hypodermic needle is inserted through the skin about 1 cm. below the larynx in a slanting caudad direction, the entrance of the needle into the trachea being readily felt. The injection should not be so rapid that the injected solution fills the entire tracheal lumen, but it should flow down the sides of the trachea. If the lumen is entirely filled, an expiration may drive some of the injected fluid into the larynx causing cough. In the authors' experiments each injection of about 0.5 ccm. consumed approximately five seconds.

In the human subject no data are available, the authors state, as far as their knowledge goes, but *a priori* it would seem that an intratracheal injection is almost as simple as in the lower animals. The free hypodermic needle could be inserted into the tracheal lumen immediately below the cricoid cartilage. The needle itself should preferably be connected with the syringe by a short length of rubber tubing to minimize the danger of breaking the needle by a sudden move of the patient. The amount of the solution should not be too small, so that at least a fraction of it may reach the alveoli as promptly as possible; 3 to 5 ccm. probably would suffice.

In conclusion it may be said that the incorporation of drugs by intratracheal injection, while not as generally applicable as other methods, nevertheless has advantages which warrant its use also in human therapeutics.

GEORGE E. BEILBY.

**Pighini, G.: The Alterations the Endocrine of Glands, Especially the Thymus, and of the Blood Following Vagotomy** (Le alterazione delle ghiandole endocrine, specie del timo, e del sangue in seguito alla vagotomia). *Riv. sper. di freniat. e med. leg.*, 1916, xli, 549.

In his researches on the effects of thymectomy on fowls Pighini noticed that in some animals in which the two pneumogastric nerves were accidentally sectioned grave dyspnoea and cachexia were produced, followed after a few days by death. The most characteristic findings at the autopsy were similar to those found in animals which died in cachexia after thymectomy, i. e., dyspnoea, cachexia, venous stasis in many organs, splenic anaemia, great increase in the volume of suprarenal capsules, especially the chromaffin parts.

This coincidence led him to undertake further

studies, particularly to find if similar effects might follow a lesion of the vagus, whether or not accompanied by a thymectomy. He therefore carried out a series of experiments on fowls and guinea pigs, sectioning the vagus in the vicinity of the neck and studying the clinical syndrome as well as making detailed macro- and microscopical autopsy studies. These studies with the technique are described in detail, and from them the author deduces the following conclusions:

1. Fowls do not survive vagotomy more than four to five days; guinea pigs about the same time.

2. Among the effects of vagotomy a clear distinction must be made between those which depend on the altered rhythm of the respiration and circulation with relative venous stasis of many viscera and a final asphyctic state, and those which are directly imputable to the cessation of the action of the vagus innervation on certain glandular or systemic organs. The first effects result owing to the abolition of the vagus function on the respiration centers and vessels, and the second from the suppressed innervation of the vagus upon organs which had a direct functional correlation with the vagus.

3. Among the organs which react directly to vagotomy are the hypophysis, the thyroid, the chromaffin gland of the capsule which are seen, especially the last named, to be in a state of hyperfunction; the thymus and spleen which show atrophic processes, especially the thymus which in fowls causes a marked lipoidean degeneration; the interrenal cortical of the capsule, the interstitial of the ovary and testicle; the medullary of the long bones which shows alteration in lipid content; the circulating blood shows an abnormal distribution of white corpuscles, a prevalence of neutrophiles, and a notable diminution of eosinophiles.

4. The thymus, the spleen, the cortical of the capsule, the interstitial of the testicle and ovary, and the osseous medullary have an exchange and an internal secretion which is in part regulated by the autonomous action of the vagus.

5. The vagus being suppressed, the functions of these organs are consequently diminished, and the sympatheticus tonus is increased which is manifested by the hyperfunctioning of the chromaffin gland of the capsule (and in a lesser degree of the thymus and hypophysis) and in the increase of adrenalin substance in the circulating blood. W. A. BRENNAN.

## RADIOLOGY

**Moriarta, D. C.: Radium a Palliative.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

After a limited experience with a small amount of radium in the relief of the symptoms in terminal cancerous conditions of the female breast and pelvis, the author reports six cases in which the pain, odor, and hæmorrhage had been alleviated. He also mentions that other clinical workers in radium have reported the same results without emphasis, however, on its usefulness in this particular field. The



author states that he has made no claim to a cure or prolongation of life, simply the alleviation of the symptoms. A synopsis of the cases reported shows that pain was relieved, that the odor was markedly controlled, and that hæmorrhage ceased. Two died in coma, two months after treatment. Four are alive and hopeful at the present time.

Moriarta believes it possible to produce a toxæmia with radium locally, which may prove serious, and suggests two precautions when using radium locally. First, a patient with a low leucocyte count should not be given prolonged applications of radium. Second, when radium is used locally it should be accompanied by the liberal administration of alkalies. The author worked with only 25 milligrams of radium element, but for periods varying from 250 milligram hours to 9,600 milligram hours continuously. His convictions are that no case of this type is so desperate and no post-operative condition so hopeless that radium should not be used with an expectation of the alleviation of the trying symptoms.

**Crosby, L. G.: Deep Roentgen Therapy of Benign and Inoperable Malignant Conditions by Improved Technique.** *Colo. Med.*, 1916, xiii, 183.

After brief mention of those physical characteristics of the roentgen rays which are factors in their use as a therapeutic agent, the author describes the chief differences between the technique employed in present-day deep roentgen therapy and that in use prior to two years ago. To the use of Coolidge tubes, filters, accurate devices for measuring dosage, and the cross-fire method of treatment he ascribes the very much better results which can now be obtained.

In common with various authors whose reports he cites he has been able to obtain marked improvement or symptomatic cure in a large percentage of deep-seated lesions treated. He concludes that the roentgen ray should be used in all cases of inoperable malignant disease; that its post-operative use in malignant cases be universally resorted to; that it is a valuable adjunct to other lines of treatment in Graves' disease, splenic leukæmia, and Hodgkin's disease; and that in menorrhagia and myomata it be employed in any case in which operation seems ill-advised.

ADOLPH HARTUNG.

**Hirsch, I. S.: Roentgenographic Control of the Pneumothorax Treatment of Pulmonary Tuberculosis.** *Med. Rec.*, 1916, lxxix, 1029.

The application of the roentgen method assists in the selection of cases, permits the estimation of the degree of collapse and of the effect on the opposite of lung, indicates graphically the displacement of the heart and mediastinum, and aids the early discovery of complications.

It appears almost impossible by physical examination to determine the extent of the pneumothorax, the position of the collapsed lung, or to estimate the displacement of mediastinal structures. These dif-

ficulties demand all the diagnostic means at our disposal.

Both methods, roentgenoscopic and roentgenographic, should be employed. With either omitted the examination is incomplete. No description of the fleeting image seen on the fluorescent screen, however accurate, can compare as a graphic record with the permanent plate, which also gives the finer structural detail not to be seen with the screen.

Roentgen study is made at three periods: (1) preliminary, for the estimation of the amount of disease; (2) during and immediately after the injection; and (3) later to determine the amount of the collapse, restitution, etc.

There appears to exist a belief that opening of the pleura and the admission of air invariably results in immediate and complete collapse of the lung, but it has been demonstrated that the lungs may functionate while there is a large pleural opening and that considerable quantities of gas are necessary to obtain extensive collapse.

Examination after injection gives the following data:

1. The degree of pneumothorax. Is the air present in all parts of the pleural cavity or confined to a particular part?
2. The complete or partial collapse of the lung and its mobility.
3. Presence or absence of pleural effusion.
4. Degree and manner of mediastinal displacement. Is there excessive strain on the blood-vessels? (The heart displacement is not proportional to the amount of gas injected and varies with the same amount of gas.)
5. The movement and displacement of the diaphragm.
6. Subcutaneous emphysema; presence and degree.
7. Restitution and reinflation.
8. The effect may be studied from time to time and comparisons made.

DAVID R. BOWEN.

**Clark, W. L.: The Treatment of Nævus Flammeus and Allied Conditions by Filtered Ultraviolet Rays, Employing the Compression Method of Application.** *Therap. Gaz.*, 1916, xl, 312.

Ultraviolet rays, as applied by the author, were found most efficacious in the treatment of "port-wine" nævus, lupus, erythematosus, eczema rubrum, and acne rosacea. He used a Kromayer modification of the Cooper-Hewitt mercury vapor lamp for generating the rays, which were passed through quartz lenses cooled by a continuous circulation of water. He found the interposition of a thin disk of blue colored quartz of decided advantage, this acting as a filter for the irritating wave lengths and increasing the penetration.

The tissues treated were firmly compressed to produce a temporary ischæmia and the surrounding structures were protected by the use of zinc-oxide adhesive plaster which effectively cut off the rays. An application of 30 to 40 minutes was found to pro-



duce the maximum of beneficial results. This was repeated, if necessary, after three weeks and some cases required a third or fourth application after a similar interval.

A few hours after treatment a reaction set in. First the area treated became slightly darker and moderately swollen and oedematous. This reaction became more intense for about 48 hours and then began to subside. Slight desquamation of the skin occurred and after one to two weeks the naevus became markedly lighter in color. Similar results followed each treatment although to a lesser degree. Brunettes were found less susceptible than blondes. Children reacted more favorably than adults. The best results were obtained with those naevi which faded readily upon pressure. Where connective-tissue hypertrophy was present absolute obliteration rarely occurred but marked improvement resulted.

Ten cases of "port-wine" naevi thus treated are cited in detail with results varying from slight improvement to complete success. Partial failure in two cases was ascribed to a coating of carbon on the quartz lenses, and a word of caution is given to avoid this. In some of the cases having scars due to previous treatment, marked improvement of the scar followed the ultraviolet light treatment. Enlargement of features due to blood engorgement complicating some of the cases was materially reduced.

The author concluded that filtered ultraviolet rays applied by the compression method produces good cosmetic results in the treatment of "port-wine" naevi, telangiectasis, rosacea, and other superficial vascular skin lesions. A. HARTUNG.

**Burns, J. E.: Thorium, A New Agent for Pyelography.** *Bull. John Hopkins Hosp.*, 1916, xxvii, 157.

Ever since the introduction of pyelography by Voelker and von Lichtenberg in 1906, its prime importance in the rôle of renal diagnosis has readily been recognized. Although various attempts have been made to replace collargol, the medium recommended by them for injection, it has proven to be the pyelographic agent par excellence up to the present time. The various colloidal solutions of salts of heavy metals, which have been tried as substitutes, are those of silver, iron, bismuth, copper, lead and mercury, as have suspensions of the salts of bismuth, calcium, and magnesium. All of these solutions form sediment on standing, and while being for the most part quite opaque to the roentgen ray, are viscous; moreover, a great many are quite toxic and irritating.

The chief objection to collargol is its irritant action when it escapes into the tissues, and, as a matter of fact, there have been a number of deaths reported following its use. Its elimination from the urinary tract is somewhat prolonged on account of its viscosity. The fact that it stains everything with which it comes in contact makes it objectionable. It

is also quite expensive; for this reason its use for cystograms and large hydronephroses is often prohibitive.

Since the opacity of a substance to the roentgen ray depends upon its atomic weight, thorium, being next to the heaviest known element, was quite ideal theoretically and seemed worthy of careful investigation. The nitrate and chloride of thorium are quite readily soluble in water, giving a clear, markedly acid and astringent solution. These solutions, however, are quite irritating and it was necessary for the authors to discover some means of combining the substance to render a less irritating product.

After a careful series of chemical studies of the various combinations into which thorium may enter, a solution containing a double citrate of sodium and thorium, together with an excess of sodium citrate and some sodium nitrate, was found to possess the qualities desired as being necessary for an ideal pyelographic medium. After a careful clinical and experimental study the authors conclude as follows:

Thorium solution fulfills all the conditions necessary for an ideal pyelographic medium. Clinically, there has never been the slightest evidence of toxicity in a series of one hundred and twenty-five cases, the amounts used in a single case varying from a few cubic centimeters to almost a liter. This alone is proof of its non-toxicity.

Experimentally, although in a few instances death has followed the injection of large doses into the peritoneal cavity and tissues of animals, larger doses intraperitoneally and intravenously have produced no ill effects. That the solution is non-irritating is shown by the absence of urinary symptoms after its use, and the absolute lack of any such evidence cystoscopically and at operation.

The pyelograms and cystograms made with this solution show a splendid shadow which possesses an unusual clearness of delineation. The solution is clear and watery; therefore it possesses a great degree of fluidity, permitting its ready elimination from the urinary tract. It is perfectly clean and does not stain the linen. In this particular it possesses another marked advantage over other solutions, particularly those of the silver salts. It is quite inexpensive, being about one-third as expensive as collargol.

GEORGE E. BEILBY.

## MILITARY SURGERY

**Metcalf, J., and Keys-Wells, E. N.: The Anatomical Position of Localized Foreign Bodies.** *Lancet*, Lond., 1916, cxc, 1078.

The localization of foreign bodies has been greatly simplified with the improved methods. Many cases arise, however, where it is important to know what structures lie above or below a foreign body. For example, in the thick parts of the body it may not be possible to secure satisfactory pictures in two planes. It is therefore necessary to estimate the depth of the foreign body in centimeters and this can usually be done. The question as to the relations



of the foreign body are not greatly simplified, however, unless the depths at which anatomical structures lie are known by the surgeon. For example, the radiographer reports a bullet to be 9 centimeters deep from a mark on the front of the thigh over the great trochanter. If the surgeon knows that the average depth from the skin to the great trochanter anteriorly is 10.8 centimeters and from the back 9 centimeters he would be justified in concluding that the foreign body lay just in front of the trochanter.

The author has tabulated a careful list of different parts of the body with the corresponding depths at which the different structures are placed beneath the surface.

J. H. SKILES.

**Dehelly and Dumas: Sterilization of War Wounds** (Stérilization des blessures de guerre). *Presse méd.*, 1916, p. 203.

The authors give the technique of their treatment for the rapid disinfection of war wounds. They use a solution of 1:200 of hypochlorite of sodium prepared according to Dakins' method. The special technique for obtaining access to the deeper parts of wounds is described. The treatment comprises surgical intervention, continuous instillation, and careful after-treatment. Intervention is done aseptically as under operative conditions, and following this it is necessary that all parts of the wound be kept in permanent contact with the antiseptic solution. For closure of the wound the authors prefer adhesive strips to sutures.

Of 155 cases of extensive wounds due to shells, bombs, and mines which have been treated by this method, 135, or 87.4 per cent, have closed. Of these, 119 were cicatrized in less than 30 days. Twenty-five of the 155 cases were complicated with fractures and of these 18 were cicatrized in less than 30 days.

W. A. BRENNAN.

**Fiessinger, Moiroud, Nimier, and Vignes: Study of Pus in War Surgery, by the Pyoculture Method of Delbet** (Étude sur le pus en chirurgie de guerre, par la méthode de la pyoculture du Delbet). *Presse méd.*, 1916, p. 197.

The authors have studied the method of pyoculture in a surgical field ambulance, and their experience is based on 120 practical tests in different types of war wounds. They have endeavored to ascertain whether pyoculture could determine the kind of operative intervention.

They find that a positive pyoculture does not suffice to indicate intervention; thus in 58 per cent of their cases a positive pyoculture was followed by a normal evolution of the wound without intervention. The necessity for intervention is only marked in 33 per cent of the cases. On the other hand when the pyoculture is nil or negative, it does not always indicate that intervention will not be necessary. Thus in 13 per cent of the cases, where the pyoculture was nil or negative, intervention was necessary. In the presence of a pyoculture which is nil or nega-

tive expectant treatment may be advised, but it may be necessary to resort to operation.

W. A. BRENNAN.

**Proust, R.: Considerations on Some War Injuries After Eighteen Months of Campaign** (Considerations sur quelques plaies de guerre après dix-huit mois de campagne). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1270.

Proust submits some general ideas gained from eighteen months' experience in field ambulances. From May, 1915, to February, 1916, while in charge of Surgical Automobile Ambulance No. 1, Proust cared for 1,800 wounded, most of which had severe, infected wounds. The mortality was 23 per cent.

In injuries to veins or arteries the author ligates the vessel some distance above and below the injury and resects the injured part.

In bone lesions, free splinters of bone should be removed, but care must be used as regards other lesions.

For articular wounds, Proust believes that when any articulation is traversed by a projectile other than a bullet the opening must be largely widened so as to ensure drainage; and certain resections such as of the patella and astragalus may have to be resorted to. Patellectomy has given 15 recoveries in 19 grave wounds of the knee; 16 shoulder-resections gave 14 recoveries. Operatory indications are exceptional for nerve-resections.

In the case of wounds which are difficult of disinfection even after free opening up, Carrel's method, i.e., intermittent instillation of freshly prepared Dakin's solution, has given the best results.

When amputations are necessary Proust always resorts to plane section. In the 1,800 wounded treated there were 152 amputations with a global mortality of 15 per cent, distributed as follows:

52 thigh amputations.....	47	per cent mortality.
31 leg amputations.....	16	per cent mortality.
9 foot amputations.....	18	per cent mortality.
29 arm amputations.....	27	per cent mortality.
18 forearm amputations.....	5.5	per cent mortality.

The mortality however has decreased under better conditions, etc. Thus from June to July the mortality was 72 per cent, from September to November 32 per cent, from December to January 20 per cent.

W. A. BRENNAN.

**Freund, H.: Experiences with Gaseous Gangrene in War Surgery** (Kriegschirurgische Erfahrungen bei Gasgangraen). *Beitr. z. klin. Chir.*, 1916, xcvi, 447.

Freund gives his experience with gas gangrene based on the treatment of 39 cases, 10 of which were of the epifascial type and 29 deep muscular tissue gangrene.

The history of gas gangrene is traced since Velpeau first made observations on the condition in 1855 and since the discovery of the gas bacillus by Fraenkel in 1882. The epifascial form of gas gangrene gives its indications between the skin and the



fascia. The typical discoloration of the skin, the intense œdema, the changes in the subcutaneous tissues, and the finding of the gas bacillus are characteristic. This epithelial form is sharply differentiated from the subfascial, muscular form and may be considered a distinct entity. The specific symptoms appear on the third or fourth day.

The subfascial form of gas gangrene is distinguished by the unusually violent halting pains in the wound, remarkably accelerated pulse, and great unrest of the patient. The clinical picture is not accounted for by the severity of the injury, nor by any local symptoms, but the vicinity of the injury is exceedingly sensitive.

Fruend describes the three different stages of alteration which may be observed in the muscles due to gas gangrene. In every case it is observed that the peripheral part of the injured muscle is more involved than the proximal part.

In the lighter forms, incisions in the fascia, widening of the wound, and oxygen insufflation suffice to effect recovery; but in the subfascial forms even deep and wide multiple incisions will often not suffice, and in 8 cases so treated by the author he was obliged to amputate the limb in 6 with 2 deaths. Kuemmell's statistics of mortality was 32 per cent and Franz's 53 per cent in subfascial cases.

In the treatment of the subfascial form early diagnosis is important. Free opening up of the parts and excision of the diseased parts of the muscle is the best procedure. Sometimes it may be necessary to remove a whole group of muscles.

Amputation must be resorted to when in spite of such energetic action the necrotic conditions are seen to spread in the muscles, or the muscles of the proximal joint are involved. W. A. BRENNAN.

**Policard, A., and Desplas, B.: Researches on the Secondary Suture of War Wounds** (*Recherches sur la suture secondaire des plaies de guerre*). *Lyon chir.*, 1916, xiii, 43.

This article which is the result of the collaboration of a biologist and a surgeon is said to be only a preliminary study. The authors give the details of four observations, describe their technique, and discuss the physiology of wounds with regard to secondary suture. They think that there is an essential difference between secondary reunion in wounds and reunion by first intention in the case of operative wounds.

In the latter the phenomena are exclusively those of conjunctive regeneration. But war wounds are always infected, even if only slightly so; and to the tissue reparation must be added the defense against infection. The coexistence of an inflammatory reaction with conjunctive reparation gives a special phase to such injuries.

Study of such a war wound between two points of suture shows that there is a multiplication of germs, while scarcely one may be found in the exudate before suture; after it 20, 50, or even 80

germs may be found, including streptococci bacillus pyocyaneus, etc. This multiplication begins immediately after suture and lasts three to five days. From the fourth to the seventh day germs are no longer found.

At the same time there coexists a notable leucocytary reaction. There is an afflux of neutrophile polynuclears. When the inflammatory reaction is subsiding masses of leucocytes undergoing nuclear transformation are always met with, and the presence of such when noted is always an excellent index of the satisfactory evolution of a sutured wound.

It is important to follow the evolution of a secondarily sutured wound by frequent microscopical examination of the serosity which flows between the two points of suture. The mode of such secondary suture is little known; but it represents such a surgical and social advance that multiple researches by discovering and comparing the factors which constitute it will lead to its generalization.

W. A. BRENNAN.

**Perret, M.: Results Obtained from Employing Carrel's Method in War Surgery** (*Resultats obtenus par l'emploi de la méthode Carrel en chirurgie de guerre*). *Bull. Acad. de méd., Par.*, 1916, lxxv, 414.

From August to December, 1915, Perret treated 111 severely wounded cases in his ambulance service by the Carrel method. Of the series 78 were lesions of the soft parts; 33 were osseous lesions. There were no deaths. All the wounded have recovered and are in good condition. Not a single amputation was necessary. The method has eliminated infection according to the author.

The author states that all surgeons at the front are unanimous in declaring that the wounded treated by the Carrel method rapidly recover. As to whether Dakin's fluid is the only one capable of bringing about this result or not there is no longer any doubt and any delay in applying he considers a grave fault. W. A. BRENNAN.

**Uffoltz: Secondary Union of War Wounds by First Intention in the Field Hospitals** (*La Réunion secondaire des plaies de guerre par première intention dans les formations sanitaires de l'avant*). *Bull. Acad. de méd., Par.*, 1916, lxxv, 335.

The results obtained by Carrel and his confrères in the secondary reunion of non-sutured wounds were obtained under very favorable surgical conditions in a rear hospital; but it was questioned whether these results would have been obtained in a field service hospital where such favorable conditions did not exist. The memoir now submitted is in answer to this criticism. This independent report of Uffoltz demonstrates that Carrel's abortive method of infection, if it may be so termed, is applicable at the front as well as at the rear.

Of 18 wounds in which the method was followed with success, 12 were shell or grenade wounds, which are generally infected, and 6 were caused by



rifle bullets, but of such a nature that they might be classed as infected wounds. The rule has been followed in these cases of not suturing contused or infected wounds and allowing them to unite by secondary intention.

In his communication of October last Carrel discouraged suturing. He preferred the employment of agglutinative strips to draw together the external as well as the deep edges of the wound. In large and deep wounds the strips are applied after having the deep edges approximated by some strengthening stitches. This procedure favors cicatrization from depth to surface. In the 18 cases now reported 10 were sutured, but the suturing was late and after the freshening of the edges; in 6 cases adhesive strips alone were used and in 1 case of a large and deep wound shell of the arm, reunion was effected by deep sutures on the ninth day. This was followed by the use of adhesive strips, and cicatrization was complete by the forty-eighth day. Under the usual treatment the repair of such a wound would take from three to four months. The author believes that the Carrel method has abridged the treatment of war wounds by one-half or two-thirds.

The technique followed in these cases is that of Carrel, but Pozzi is not quite sure that the modified form of Dakin's solution has been used. Carrel has intimated that he now uses Dakin's solution, prepared as follows:

For 10 liters:

Chloride of chalk . . . . . 200 grams.  
Carbonate of soda, dry . . . . . 100 grams.  
Bicarbonate of soda . . . . . 80 grams.

The ingredients are mixed cold with 5 liters of ordinary water, triturated, etc. No heat is employed.

W. A. BRENNAN.

**Enderlen: Experiences of a Consulting Surgeon**  
(Erfahrungen eines beratenden Chirurgen). *Beitr. z. klin. Chir.*, 1916, xcvi, 419.

Enderlen gives his experiences of German war surgery from his diary notes. In the early part of the war, the conservative treatment of wounds was found to be unsuccessful and after October, 1914, active treatment was instituted in lieu of it.

Gas phlegmons, or gas burns as they are called by Fraenkel, were seen not only in the superficial but in the deeper tissues, and seemed to result from all kinds of wounds. In the lighter epifascial phlegmons incisions and bandages soaked with  $H_2O_2$ , or acetic acid, and oxygen insufflation generally sufficed; but in the more serious cases and deep involvement amputations of limbs was necessary.

During 1914, Enderlen lost 27 out of 34 cases of tetanus, although all the usual means were used. The scarcity of tetanus at the present time is due to prophylactic vaccination.

Cranial wounds since October, 1914, have been re-examined, and active measures instituted. Drainage and suturing have given good results. In the case of chest wounds the thorax was closed when possible. In larger defects of the chest wall the

lungs were sutured in to prevent mediastinum depression. Autopsy in two cases showed completely collapsed lungs and empyema. Hence, it is best before closing the chest cavity to inflate the lung by simple pressure.

Enderlen operated from the beginning in intestinal gunshot wounds and had 67 successful cases out of 154. After ten hours, if not operated, the chances of success are slight. Liver and kidney injuries are better adapted for conservative treatment. Intraperitoneal bladder injuries are mostly fatal. Extraperitoneal bladder injuries can usually be managed with continuous catheterization. Urethrotomy is generally called for in urethral injuries.

In spinal region injuries the outlook is not entirely hopeless. Treatment should be instituted even though the prognosis is gloomy. In the lumbar spine the results give even better promise. Enderlen mentions a few cases of sectioned nerves which were sutured with good anatomic result.

For vascular injuries Enderlen has used ligatures, suturing, and transplantation. The ligature is generally confined to the smaller vessels; but suture will be used in the femoralis, popliteal, carotids, and other large vessels as in these cases the ligature of the vessel is liable to cause gangrene in the limb. In the brachial and femoralis Enderlen both sutured and transplanted with good results.

W. A. BRENNAN.

**Fiolle, J., and P.: The Advanced Surgical Post** (Le poste chirurgical avancé). *Rev. de chir.*, 1916, xxxv, 302.

The authors believe the establishment of advanced surgical posts in the battle line is necessary. In such a post properly constructed and protected the surgeon can operate safely and calmly. Such operations are not only acceptable, but are demanded by the wounded. The utility of such posts as regards hæmorrhagic injuries is unquestionable.

In other conditions, such as abdominal wounds, early intervention is the essential condition for success. For such the advanced post is necessary. Amputations must yield to early resections. Infection is, next to hæmorrhage, the cause of numerous amputations which can be avoided by care and attention in the advanced post. Where wounded cannot be despatched every day to clearing hospitals, the advanced surgical post is indispensable.

Details are given of 84 operations carried out in such a post, also of the necessary accommodations, construction, and equipment.

W. A. BRENNAN.

## HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

**Burden of Proof in Actions for Negligence.** (*Niebel et al vs. Winslow* (N. J.), 95 *Atl. R.* 995.) *J. Am. M. Ass.*, 1916, lxxvi, 1737.

In the case of *Nubel vs. Winslow* the New Jersey Court of Appeals discussed the propriety of the following instruction which the trial court gave to the



jury: "If you find that the gauze was left in the abdomen of the plaintiff and the incision sewed up by the defendant or allowed to heal over it, the burden of proof is on the defendant to show that it was not left there by any carelessness or negligence of his," and stated that in an action for negligence against a physician the burden of proving the negligence alleged rests upon the plaintiff and is never shifted to the defendant.

J. A. CASTAGNINO.

**Injury to Undiseased Parts in Performance of Operations—Evidence.** (*Evans vs. Roberts (Ia.)*, 154 N. W. R. 923.) *J. Am. M. Ass.*, 1916, lxvi, 1577.

The usual malpractice suit is one in which the alleged injury is claimed to have been sustained to the organ treated or operated upon, but the above case is one in which the operator injured the patient by cutting the tongue in an operation for the removal of adenoids. In discussing this case the reviewing court mentioned a number of hypothetical cases, such as an operation for tumor, the operator allowing the knife to slip, cutting the patient's ear, or stitching a wound in the patient's cheek and awkwardly thrusting the needle into the patient's eye, and like cases. It is a matter of common knowledge and observation that such occurrences do not ordinarily occur in the service of one possessing ordinary experience and skill in surgery. Scientific knowledge or training is not necessary to understand that such results are not to be expected if reasonable care is practiced by the attending surgeon, but when they do happen, that fact, together with proof of other facts and circumstances showing sufficient negligence to allow the case to be presented to the jury for consideration, courts would be inclined not to disturb the verdict. In the case at bar the defendant stated that the gag slipped. In the absence of any explanation the jury might reasonably infer that the gag was not properly adjusted. The testimony of the father to the effect that the curette was removed from the child's mouth with a sudden jerk is scarcely consistent with the exercise of reasonable care. These facts, with the resultant injury, would be sufficient in the opinion of the court to allow the case to be presented to the jury.

Negligence or absence of negligence in malpractice cases of this character is not necessarily established entirely by the testimony of experts. The question of the advisability of the method employed need not necessarily be considered as a vital point by the jury. The jury would not necessarily be interested in the method employed or whether such method were scientifically correct. The sole question for consideration was whether the unintentional wounding of the patient was caused by negligence or lack of due care on the part of the attending surgeon. It was proper, therefore, for the court to allow experts to testify as to the method employed and the instruments used and also to allow a similar gag and curette to be introduced as evidence.

A similar case has recently been decided by the Illinois Appellate Court, not yet reported, however, in which the facts are briefly as follows: The plaintiff, a man of mature years, called on the defendant, an extractionist, to have a lower right molar tooth extracted. The defendant attempted to remove the tooth and a fracture of the jaw resulted. The case was tried in the circuit court of Cook County and allowed to go to the jury. The jury, however, returned a verdict in favor of the defendant. The plaintiff appealed the case. The Court there stated:

"The case of the plaintiff is predicated solely upon the fact that the fracture of the jaw and other alleged physical injuries resulted from the treatment of the defendant by the plaintiff. Proof of a bad result of itself is not evidence of negligence or lack of skill. . . . The burden rested upon the plaintiff to show a want of care or skill in the treatment and that the bad result that followed the treatment was the result of such want of care or skill. No presumption that the defendant was not skillful or was negligent follows from the mere fact that the jaw was fractured and that the plaintiff was otherwise injured."

It will be noted that the plaintiff in the Illinois case failed to introduce any testimony in the record as to how the fracture occurred but that in the previous case the testimony of the father in regard to the suddenness of the removal of the curette and also the testimony of the defendant himself stating that the gag slipped, was sufficient, in the opinion of the Court, to allow the case to be presented to the jury and also to allow the jury's verdict for the plaintiff to stand.

J. A. CASTAGNINO.

**A Waiver of Privilege.** (*Dewey vs. Cohoes & L. Bridge Co. (N. Y.)*, 155 N. Y. Supp. 887.) *J. Am. M. Ass.*, 1916, lxvi, 1814.

In the above case the court reversed a judgment in favor of the plaintiff on account of error on the part of the trial court in not allowing defendant's witness, a hospital surgeon, to testify as to the condition of the plaintiff at the time the plaintiff was in the hospital following the injury. The trial court allowed the plaintiff to introduce testimony as to his condition and also the testimony of the physicians who attended him and who described his condition minutely and even allowed the plaintiff to introduce into evidence roentgenograms of the organs and parts of the body claimed to have been injured. The defendant then offered the testimony of a surgeon who had examined the plaintiff at the time he was confined at the hospital, the examination being made at the request of the plaintiff. An objection to his testimony was sustained. The court said that the question of the physical condition of the plaintiff while at the hospital was very material to the issues and the defendant had a right to have the benefit of the evidence of the surgeon who had made an examination of the plaintiff at the time. It would seem unfair that the plaintiff could call certain of his physicians to testify and



refuse to allow others to do so. The claim was made that the plaintiff had called the surgeon in question to make an examination of him for the purpose of treatment and, therefore, that his knowledge was privileged, but the reviewing court held that inasmuch as the plaintiff had placed his body before the jury as a basis for damages and had called some of his physicians to testify in his behalf that he had waived his right to hold that the knowledge gained by the witness offered by the defendant was in the nature of a privileged communication. The reviewing court reversed the judgment on the above grounds.

J. A. CASTAGNINO.

**Responsibility for Loss of Drainage Tube in Body of Child.** (*Cyr vs. Landry* (Maine), 95 *Atl. R.* 883.)  
*J. Am. M. Ass.*, 1916, lxvi, 1883.

In an action or suit for malpractice against a physician the alleged claim was that through the alleged negligence and carelessness of the operator the drainage tube was allowed to slip into the body of

the patient. The operation was for pleurisy. A tube was placed in the incision for drainage and secured by a safety pin to a piece of gauze wrapped about the tube. Through improper manipulation of the dressings by the child's mother the tube slipped into the body. The defendant relieved another doctor in the treatment of the case and at that time the tube could not be found. The mother thought that the tube might be inside the child's body but denied that she had interfered with the dressings. In view of the impossibility of the tube slipping into the the cavity unless the safety pin with which it had been secured was removed, the defendant was misled into believing that the tube was not in the body of the child. The Superior Court of Maine stated that in view of the above circumstances, in their opinion the defendant exercised such care as ordinary medical skill and knowledge afforded by directing the mother to take the child to a hospital for an operation if she believed that the tube was in the child's body.

J. A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Clark, S. M. D.:** Discussion of Cancer of the Cervix Uteri with Especial Reference to the Combination Method of Treatment. *Texas St. J. Med.*, 1916, xii, 132.

For convenience of discussion, cervical carcinomata are divided into four groups as follows:

1. In the first group are found the incipient cases. The ulceration is strictly limited to the cervix and there is no evidence of lateral infiltration. The uterus is freely movable. Menstruation is slightly prolonged, with an occasional irregular show. There is an irritating vaginal discharge. The patient is constitutionally unimpaired and a good surgical risk. Cases falling in this group are treated by combining at the one sitting the application of the heat and the radical removal. The Wertheim removal is undertaken.

In fat women, the Percy cautery alone gives these early cases their best chance of cure, since the technical difficulty of carrying out the radical plan is too great and, further, the high primary mortality would discount its feasibility.

It is most deplorable that more cases do not fall under this first group. Once there is a thorough co-operation of an alert profession with an educated public the percentage of early cases will increase.

2. In the second group the cervix is well infiltrated with carcinoma, with a slight extension to the vaginal wall. Though as yet there is no pain in the sides, still a definite thickening and a slight involvement of the parametrium can be palpated. The uterus is still movable, with irregular flowing and, at times, profuse loss of blood. There is secondary anæmia and the patient is constitutionally below par. Many of these cases succumb from the operation since they are poor surgical risks. These cases must be transformed constitutionally before being subjected to the major operation. It is here that the Percy cautery, in combination with ligation of both the internal iliac and ovarian arteries, as a two-stage sitting, so excellently serves the desired ends.

After the preliminary sitting, these patients are kept in bed for ten days when they are allowed to be up and are placed on forced feeding and Bland's pills. In from three to five weeks there will be noted a marked change both locally and constitutionally. With the cessation of the hæmorrhage, as well as the toxæmia, the hæmoglobin will have risen from 15 to 30 per cent, the vessels are full, the entire economy has improved and from having been a doubtful surgical risk, the case is now in a frankly operable state. Radiotherapy is in its swaddling clothes; it is now in its experimental stage and it is

too early to come to conclusions. The only attitude to be taken is that of a receptive state of mind.

3. In the third group the cervix is markedly infiltrated with carcinoma, having extended at least an inch on the vaginal wall. Usually there is a large crater or huge cauliflower mass bulging into the vaginal canal. There is marked impairment of mobility with noted lateral infiltration from the lower segment of the uterus. Pain in one or both sides is experienced. Pronounced cachexia and anæmia are present. Constitutionally and locally they are inoperable. Heretofore these cases have been treated from the utterly hopeless standpoint.

The combination method of treatment can be adopted to advantage in this group. While in the abdomen for ligation, a thorough prospectus of the extension of the disease can be gained and the lymphatics removed as a guide to the possibility of future surgical procedure. It is in this stage of the disease that we are apt, in the repeated use of the cautery, to injure the bladder or possibly the rectum. In some of these cases the local and constitutional condition will have so decidedly improved after the cautery and ligation that, judging from the mobility of the uterus, it will be thought possible to do a complete operation for after the upper two-thirds of the uterus is freed and the ureters detached from the focus, one usually finds that the upper two-thirds of the uterus parts from the lower infiltrated segment.

4. The fourth group comprises the absolutely hopeless class of cases. The rectum, bladder, and vagina are in one conglomerate, infiltrated mass; there is frequent and, at times, copious flowing with foul vaginal discharge, advanced cachexia, wrecked constitution; besides, the patients are usually addicted to taking large doses of morphine. More damage than good follows any attempt at local treatment in these cases. Deep X-ray exposures or massive doses of radium will give some relief from pain, but the cases are hopeless.

EDWARD L. CORNELL.

**Tennant, C. E.:** The Use of Heat in the Control of Inoperable Cancer. *Colo. Med.*, 1916, xiii, 176.

Modern investigations seem to prove conclusively that heat is one of the most effective therapeutic means we have in the control of cancer, provided it is properly applied. The subsequent use of the X-ray with cross-fire applications of the rays from a hard tube is, no doubt, good after-treatment. The source of the heat may be varied from hot water to the actual cautery, but it must be constant, long-continued, and free from insulation, in order to spread evenly a temperature of 120 to 150° F. throughout the mass.



In applying the treatment to carcinoma of the pelvis or other easily accessible structures, the Percy cautery irons are probably most satisfactory. The use of heat with the Percy irons, as a method of treatment, is proving very satisfactory in inoperable cancers of the lip, face, neck, and breast. This should be followed later by radical excision, thereby doing away with the possibility of metastatic recurrence.

The experiments which the author has made on large masses of beef lead him to believe that in the d'Arsonval current we also have a very potent and serviceable means of obtaining the same or even better results in tumor masses located in some of the more inaccessible portions of the body. This conclusion is based upon the fact that in every test made the d'Arsonval current raised the average temperature of a given mass 24° F. higher than the cautery irons did, in just one-half the time consumed by the latter.

EDWARD L. CORNELL.

**Chiaje, S. delle: Red Myoma of the Uterus** (Mioma rosso del utero). *Ann. di ostet. e ginec.*, 1916, xxxviii, 197.

The so-called red myoma of the uterus was first described in 1905 by Polloson and Violet who reported a few cases. The tumor is so-called on account of the characteristic red color, like raw flesh in appearance, which it presents in section. Since 1905 a few other cases have been described.

The author gives a summary of all cases found in the literature and describes a case of his own. In discussing these tumors the author considers that from the anatomopathologic standpoint they are usually situated on the anterior wall of the uterus and are constantly interstitial. They are almost always homogeneous and when exceptionally distinct nodules occur they never have the same structure but are fibrous in character. The tumors are covered with a fibrous capsule and in section show the characteristic coloring. The anatomopathologic features which confer a certain special physiognomy on these tumors are: (1) intense vascular hyperplasia, (2) interstitial hæmorrhagic foci, more or less diffuse, (3) embryonic character of the muscular elements. Clinically the tumors are observed to increase rapidly and give rise to pain and fever.

The brusque manifestations, the manner in which they occur, and the periodicity which they assume, give a certain clinical picture which has a diagnostic value. In the interpretation of these phenomena congestion is an element of the greatest importance. The morbid conditions with which red tumor of the uterus may be confounded are benign or sarcomatous fibromata in course of degeneration. A careful examination of the characters of the phenomena will permit of a differential diagnosis, but it is more difficult to distinguish the tumor from an ovarian cyst with torsion of its pedicle.

In the case reported by Chiaje the patient showed the local and general clinical features of a pelvic tumor, and the case was diagnosed as an ovarian

cyst with twisted pedicle. This diagnosis, however, was altered on opening the abdomen, when it was seen that the tumor was developed on the anterior uterine wall, and a hysterectomy was done. Examination of the tumor showed the anatomic characteristics of a red myoma.

W. A. BRENNAN.

**Deluca, F. A.: A Case of Unilateral Polypiform Edematous Elongation of the Uterine Cervix** (A proposito de un caso de elongacion edematosa cervical polipiforme unilateral). *Rev. de la Asoc. méd.*, Argent., 1916, xxiv, 611.

A case of this very rare complication of labor is reported by the author in a woman of 28, a II-para, who twelve hours after the onset of labor showed a fleshy tumor in the vulva, the size of a hen's egg, which though reduced reappeared as the pains became frequent and intense. The woman was removed to the hospital. The tumor was then the size of an orange, soft and pasty, wine red in color, and situated on the anterior cervical labium. One hour later the labor terminated spontaneously. After the birth the tumor gradually diminished in size and disappeared about two months later.

The author's research shows that this complication originates usually during labor and that its situation is by choice on the anterior labium. Several factors contribute to its causation. It is characterized by a distention and prolapse of the anterior wall of the inferior segment, elongation of the supravaginal portion of the uterine neck and edematous tumoration of its intravaginal part, the dilatation of the neck being at the expense of the posterior cervical labium.

Deluca thinks that the condition should more correctly be termed cervicosegmentarial or isthmicocervical unilateral polypiform edematous elongation (of Rouvier).

It always occurs with a cephalic presentation and nearly always in multiparæ. Spontaneous birth is always possible. The causes may be predisposing or determining. In the first group are comprised: the anatomic constitution of the inferior segment, multiparity, narrow pelvis, prolapse and uterine anteversion, exaggerated softening of the inferior segment, posterior presentation, etc.; in the second group: energetic uterine contractions, early presentation, and premature expulsive force.

W. A. BRENNAN.

**Wallace, C. H.: Essential Hæmorrhage of the Uterus.** *J. Mo. St. M. Ass.*, 1916, xiii, 220.

According to Wallace, essential hæmorrhage must be diagnosed by elimination from the following:

1. Hæmorrhage from retained secundines.
2. Hæmorrhage from placenta prævia.
3. Hæmorrhage from fibroid tumors of the uterus.
4. Hæmorrhage from endometritis.
5. Hæmorrhage from chronic oophoritis or cystic ovary.
6. Hæmorrhage from tubo-ovarian cyst.

7. Hæmorrhage from deciduoma malignum and uterine cancer.

8. Hæmorrhage due to senile vascular changes and hæmophilia.

Once the diagnosis is made certain, the author believes that hysterectomy or obliteration of the uterine cavity by atmocausis is the only treatment.

HARVEY B. MATTHEWS.

**Fitzgibbon, G.: The Etiology of Uterine Prolapse and Cystocele.** *Surg., Gynec. & Obst.*, 1916, xxiii, 7.

The author considers that some operation should be devised as the all-around basis for the surgical treatment of these conditions. All evidence points to the fact that prolapse of the uterus and cystocele are the result of some damage done during parturition. The probability is that it is the same structure which is damaged in nearly all the cases. In nulliparous women the defect is probably the same, but here the fault is congenital not acquired.

Lacerations of the peritoneum no matter how extensive have no effect upon the elevation of the uterus, and such lacerations could not possibly involve that part of the levator ani muscle which supports the cervix uteri. The structure which is considered the main support of the pelvic organs is the visceral or endopelvic layer of pelvic fascia. This is very fully described and shown to form a complete pelvic diaphragm broken by the passage through of the viscera and parts attached to them. This together with the levator ani muscles forms the pelvic diaphragm, the fascia taking up the constant strain and the muscle acting by re-enforcing the fascia against pressure.

In descriptions of the fascia the upper or true supporting part of the fascia is quite neglected and the thin part which follows the levator ani muscles as their inner sheaths is shown as if it were the whole of the rectovaginal fascia, whereas it is a very unimportant part. The vagina is shown by diagrams to lie obliquely below the fascia, the fornices only slightly go above the plane of the fascia while the uterus is chiefly above, having its greatest attachments in front of the plane of the broad ligaments. The bladder is wholly above the fascia, which separates it from the anterior vaginal wall. Prolapse of the uterus is the result of rupture of the fascial sling across the pelvis attached to the sides of the cervix and the lateral vaginal fornices. When this is damaged prolapse of the uterus above takes place, the vaginal fornices being gradually inverted but the bladder being retained well up. When the fascia in front of the cervix and the anterior vaginal wall is ruptured cystocele develops, but the cervix is fully maintained. These two conditions may be combined and the whole pelvic contents comes down.

The failure of the present-day operations is the result of efforts to cure prolapse of the uterus by an operation only suitable for the cure of cystocele and the failure to recognize that interposition is useless unless the cervix is maintained well up. This is effected in a certain number of cases by the practice

of doing a high amputation of the cervix and covering over the stump with the vaginal wall, in doing so a certain amount of fascia is caught in and those cases in which a sufficient amount of fascia is caught result in cures while the others relapse, but the need of catching in the fascia is not recognized. The pelvic viscera can be fully supported by an operation to unite the broken fascia in front of the cervix and below the bladder, and this can be done without removal of organs or such distortion as will render childbearing in any way hazardous and can therefore be adopted in the young parous woman without sterilization.

**Pascal, A.: Treatment of Uterine Prolapse** (Traitement du prolapsus uterin). *Presse méd.*, 1916, p. 323.

For simple retroversion where there is no adnexal lesion Pascal believes that Alexander's operation under local anæsthesia will suffice. If adnexal inflammation is suspected a laparotomy should be done and the procedure of Doléris followed, which consists in fixation of the two round ligaments in a buttonhole made in the two large right muscles. If the ligaments are weak an abdominal hysteropexy may be necessitated.

For prolapse with predominance of cystocele in women of 40, Pascal recommends vesicovaginal interposition limited to women between 35 and 45 years.

For prolapse with atrophied uterus, flaccid vaginal walls, and gaping vulva, the author is of the opinion that the Kocher operation does not give sufficient guarantee to assure the fusion of the uterus with the anterior abdominal wall and he therefore uses the Murphy operation, following the Mayo technique.

In the case of women with atrophied uterus and relaxed walls, gaping vulva, and permanent cystocele, the author uses vaginal hysterectomy completed by median suture of the two large ligaments and perineal reconstitution. In old hysterectomized subjects where the ligamental stump was not sutured to the uterine or vaginal stump, it is necessary to excise the vagina, or in case of a younger patient to make a laparotomy and fix the vaginal or cervical stump to the abdominal wall.

Whenever an operation for prolapse has been carried out the surgeon must remember that the muscular tissues are insufficient, semi-atrophied, and that such operations leave behind a tissue of fragile cicatrices. If the technique is good, surgical recovery is the rule, but it is highly necessary to strengthen the recovery by a regeneration of the muscles. This can be effected by general hygiene and Brandt gymnastics which restore tonus to the atrophied muscles.

W. A. BRENNAN.

**McCann, F. J.: The Treatment of Backward Displacements of the Uterus.** *Med. Press & Circ.*, 1916, ci, 440.

McCann has written a very lengthy paper upon the old but very important subject of backward



displacement of the uterus and the methods generally employed for its correction.

Treatment, as the author states, has very markedly improved in recent years, owing largely to the advances made in gynecological surgery and to a better understanding of the causation and sequelæ of this condition.

The subject is outlined as follows:

1. Congenital uterine displacement.
2. Retrodisplacement due to excessive mobility.
3. Traumatic uterine backward displacement.
4. Treatment of backward displacement in virgins.
5. Treatment of backward displacement in multiparæ: (a) method of replacing the uterus; (b) treatment by pessary; (c) treatment of backward displacement when pain and tenderness exist; (d) treatment of fixed backward displacement.
6. Treatment of backward displacement in parous women: (a) when the uterus is replaceable; (b) when it is fixed.
7. Operations for the correction of backward displacement: (a) abdominal; (b) vaginal.
8. Backward displacement after the menopause.
9. Backward displacement in association with uterine and ovarian tumors.
10. Backward displacement of the gravid uterus.

Treatment may consist in (1) spontaneous replacement, (2) bimanual replacement, (3) operative replacement.

The author has given under each of these headings a general plan of procedure, calling particular attention to those methods most successful in his hands. Some of his methods are original; the majority, however, are those of other gynecologic surgeons, modified or not. HARVEY B. MATTHEWS.

**Taylor, J. C.: Vaginal Hysterectomy.** *N. Y. M. J.*, 1916, civ, 53.

After a brief historical sketch regarding vaginal hysterectomy, the author elaborates upon the present-day indications for the operation and describes his method of performing it.

The indications for vaginal hysterectomy, as given by the author, may be tabulated as follows:

1. All cases in which conservation of the uterus is not to be considered, except where tumefaction renders the uterus too large to be delivered per vagina or where extensive adhesions render impossible the proper approach to the uterus.
2. In intraligamentous and retroperitoneal growths.
3. In women past the menopause who, for any reason, require hysterectomy, except in those cases where the size of the uterus prohibits its delivery through the vagina.
4. In complete prolapse of the uterus after the menopause.
5. In cancer of the cervix where the disease is too far advanced for a Wertheim operation yet it is deemed advisable to remove the uterus for the relief of pain and foul discharges. Such cases

may, however, be radiumized and later a Wertheim operation performed.

6. In cancer of the fundus where the growth is still localized.

7. In epithelioma of the cervix occurring in old women who have serious heart or kidney trouble.

The vaginal route should never be chosen where there is any involvement of the appendix or intestines which might need attention, or in complete prolapse occurring in young women.

The author's method of performing vaginal hysterectomy consists in the usual anterior and posterior separation from below upward after which the uterus is bisected; the adnexa inspected, adhesions, if present, are freed, and then each half of the uterus is removed by clamping from above downward. The space between the clamps is properly packed with iodoform gauze and a self-retaining catheter is left in the bladder. The clamps are removed in forty-eight hours. The gauze packing is removed on the sixth or seventh day and lighter packing replaced until healing is completed.

This technique is modified in the presence of fibroids or complete prolapse. Where fibroids increase the size of the tumor very materially, V-shaped pieces may be continuously cut away until the top of the fundus is reached, when division of the remaining tumor may be accomplished. In case of complete prolapse the ovarian and uterine vessels are ligated, the clamps removed, and the base of each broad ligament is sutured into the vault of the vagina, which is sufficient to hold the vaginal vault high and keep the bladder in normal position.

In conclusion the author states that in a series of over 300 vaginal hysterectomies there has not been a single death traceable to the operation itself and therefore he highly recommends this operation in all suitable cases. HARVEY B. MATTHEWS.

**Truesdale, P. E.: Vaginal Hysterectomy for Prolapsed Uterus, with a Report of Fifty Cases.** *Boston M. & S. J.*, 1916, clxxv, 13.

The author, employing a special technique, has performed 50 vaginal hysterectomies for the cure of prolapsed uteri. The procedure as recommended is limited to the class of cases in which conservation of the uterus may be disregarded. The author's cases averaged 50 years of age.

The technique employed differs from the usual vaginal hysterectomy in that the author, instead of making the incision through the broad ligaments in the usual manner, extends the line of incision inward far enough to include a considerable portion of uterine muscle. By bringing together the broad ligaments with their appended portion of uterine muscle there is formed a central body for the resistance of intra-abdominal pressure and firm support for the bladder.

This method, as the author says, is the same as the Watkins-Wertheim procedure, except that the greater part of the uterus and all the cervix are removed before the interposing act is accomplished.

A high perineorrhaphy completes the operation.

There is a tabulated end-result report of the 50 cases operated upon by the author, which shows that 74 per cent were cured, 12 per cent were partially cured, and 6 per cent were failures.

HARVEY B. MATTHEWS.

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Hawk, P. B.: The Contents of Ovarian Cysts.** *N. Y. M. J.*, 1916, civ, 16.

The toxicity of the contents of the cysts was determined by the effect on guinea pigs of the injection intraperitoneally of 10 ccm. of cyst contents. Bacteriological studies were also used. Six cysts were examined.

The contents of the cysts was found to be sterile in each case. The cysts examined showed no toxicity, regardless of the nature of their contents. No rise of temperature or loss in weight was noted in any guinea pig after injection. The animals were killed about twelve weeks after injection and no lesions could be determined microscopically. In two cases the physical nature of the contents was mucilaginous in the extreme, having the appearance of a mucin substance. That this property was due to the globulin content and not to a mucin substance was shown by the precipitation properties and coagulability of the substance in question accompanied by the lack of viscosity in the resulting filtrates. A slight amount of pseudomucin was obtained in each case, but the trace present could in no way account for the physical characteristics of the contents.

D. H. BOYD.

**Moeller, O.: A Case of Supernumerary Ovaries** (Ein Fall von ueber Zaehligen Ovarien). *Nord. med. Ark.*, Stockholm, 1916, No. 1, p. 12.

The author reports the case of a woman of 35 on whom a salpingo-oophorectomy-duplex was done. Some months later owing to the recurrence of pains in the left iliac fossa and other symptoms which contra-indicated conservative treatment a laparotomy was done. In the left uterine ligament an intraligamental walnut-sized cyst was found, also a smaller one in the back part of the right ligament. Macroscopically and microscopically these removed tumors were found to be ovaries. That of the right ligament contained a corpus luteum and both showed unquestionable ovarian tissue.

W. A. BRENNAN.

**Stark, S.: Shortening of the Round Ligaments by Transverse Suprapubic Incision.** *Tr. Ass., Am. Obst. & Gynec.*, Indianapolis, 1916, Sept.

This operation previously presented at a meeting of the Mississippi Valley Medical Association, Cincinnati, October 29, 1914, has since been simplified.

It is not a new operation but embodies features from different methods, its ensemble and purpose giving it individuality. Its principal feature is the Goldspohn derivative — inguinal liberation of the

round ligament from its peritoneal investment. The transverse suprapubic approach, as practiced by Duret, Peterson, Rumpf, Palm, Kuestner, Liepman and many others is used. Stark prefers the Goldspohn operation. He does not limit it to simple retrodisplacements, but successfully employs it when such displacements are complicated with other pelvic disorders, performing salpingectomies, oophorectomies, appendectomies, etc.

Apprehension of bleeding in the depth and greater difficulty in operation lead to transverse suprapubic incision, which when necessary is terminated in the Pfannenstiel manner or the Peterson median incision after dissection of the upper wound flap from the fascia.

As regards the technique, an incision is made transversely just above the pubes and continued laterally in the direction of the inguinal canal. The fat is removed in the line of the future attachment of the round ligaments to the abdominal fascia. An incision is then made in the aponeurosis of the external oblique in the direction of the fibers over the canal.

The round ligament is liberated by a hæmostat, and the distal end ligated and cut. Traction on the ligament brings out peritoneal reduplication; this is snipped and the incision carried along on the sides of the ligament to the desired height bilaterally. The pelvic organs are explored by inserting the index-finger, and the amount of slack to be taken up in the ligaments is determined, the excess being marked with a hæmostat. If the pelvis is normal the peritoneal opening is closed.

In closing the peritoneal opening the borders are caught high up with a hæmostat, transfixed low down on one side with catgut, then the suture passes through the upper surface of the round ligament and finally includes the peritoneal adjoining edge. The ends are tied after passing behind the hæmostats, and the peritoneal excess snipped off.

The ligaments are fixed just above the pubes in the midline by suturing one to the abdominal fascia and carrying the suture through the other ligament and tying, then passing the ends of the ligatures forward under fixation hæmostats, completing the ligation and removing the surplus.

To guard against weakness of the ring, the conjoined tendon is fastened to Poupart's ligament by suture, using reverse mattress suture. The closure is completed by suturing separately the external oblique aponeurosis (which includes the edge of round ligament) and the suprapubic wound.

When the examining finger reveals complications (adhesions, tubo-ovarian disease, etc.), the following procedure is adopted: The abdomen is opened in the midline by the Peterson method or by transverse incision; the lower ends of the external oblique incision are joined and the abdomen opened as in the Pfannenstiel procedure. The existing conditions are treated, and the opening closed according to the Pfannenstiel method. Other steps are followed out as above. In pyosalpinx, tubo-ovarian abscess, and



extensive adhesions this procedure is of great value, and is more applicable than the bi-inguinal incision.

The advantages of the method are: ease of exposure of round ligaments; rapidity of operation; single incision later hidden for most part by the pubic hair; the pull is in a forward rather than a lateral direction and permits of the application of a Pfannenstiel or Peterson procedure.

Claims for originality are: (1) All other operators employing the transverse suprapubic incision do so with a predetermined intention of opening the abdomen either in the midline or by the Pfannenstiel method which the author only exceptionally resorts to; (2) simple fixation of round ligaments in the midline to the abdominal fascia instead of to Poupart's ligament or the inguinal fascial wound and certain features in connection with the technique.

**Stanton, E. M.: End-Results in Cases Operated for Salpingitis.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 1058.

The author bases his report on a careful study of the end-results of 100 cases he has operated upon for pelvic peritonitis of tubal origin, and a study of the literature on this subject. Among 93 patients not subjected to hysterectomy there were several who for a time complained of leucorrhœa but gradually the uterine infection subsided and today he thinks each of these women is better off with her organs intact than she would otherwise have been. His experience confirmed by carefully checking the late results following operation has led him to believe that the operator should remove as little as possible and trust much to nature. C. H. DAVIS.

#### MISCELLANEOUS

**Heineberg, A.: The Causes and Treatment of Sterility in Women.** *Therap. Gaz.*, 1916, xl, 463.

Various types of sterility are recognized: (1) primary, (2) relative, and (3) secondary.

Primary sterility is that type in which the possibility of conception is precluded because of permanent congenital or developmental defects in the structure or function of the genital organs.

Relative sterility is a state in which the absence of conception is attributable to causes which are susceptible of correction. These causes may be structural, chemical, functional, or emotional.

Secondary sterility, or what is commonly known as "one-child sterility," occurs in those women who fail to conceive after the birth of one child.

The successful treatment of sterility in the female depends largely upon the recognition of its causative factors. Any case that seeks relief requires to be studied with infinite care in order to determine the cause or combination of causes which may be operative. Cognizance of the many complicated and baffling causes of sterility should cause one to hesitate to undertake its correction with the same non-chalance which has characterized most previous efforts in that direction.

The lessons to be learned from a review of this subject would seem to be:

1. Sterility in the female may be due to many causes, some apparent and easily determined, others obscure and discovered only after careful investigation.

2. Surgical treatment for its correction should not be instituted until an honest and thorough investigation has shown that the sterility may reasonably be attributed to structural changes in the female generative organs.

3. No investigation can be considered complete which does not in some way include examination of the semen.

EDWARD L. CORNELL.

**Stauffer, W. H.: The Relation of the Rectum to the Female Pelvic Organs.** *J. Mo. St. M. Ass.*, 1916, xiii, 228.

The author draws attention to the anatomical relationship existing between the female pelvic organs and the lower bowel.

Diseases of the vagina, rectum, or urethra and adjacent glands may have a common beginning and the etiology of the existing trouble be entirely overlooked because of the failure to make a thorough and complete examination of adjacent organs. As examples of such mistakes, gonorrhœa and syphilis may exist in one or all of these organs, i. e., vagina, urethra, or rectum, and if not properly diagnosed and treated in each organ, failure to relieve the patient will be the ultimate result.

In conclusion, the author urges a closer relationship between the work of gynecologist, urologist, and proctologist in order to insure the correct diagnosis and, therefore, the proper treatment in each given case.

HARVEY B. MATTHEWS.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Williamson, H.: Pregnancy Toxæmia; a Study of Acidosis in Pregnancy.** *Am. Med.*, 1916, xi, 385.

To determine the pressure of an acidosis four tests were employed: (1) the estimation of the alkalinity or rather the acid combining property of the blood serum; (2) the estimation of the proportion of nitrogen excreted in the urine in the form of ammonia salts; (3) the demonstration of the presence of acetone and diacetic acid in the urine; (4) the determination of the amount of sodium bicarbonate (administered by the mouth) necessary to render the urine alkaline.

1. The alkalinity of the blood was determined by a modification of the method described by Sir Almroth Wright. In normal pregnancy there was found to be a slight diminution in the alkalinity of the blood. In 9 cases of pregnancy toxæmia there was found to be a marked diminution in the alkalinity. In 4 cases of chronic nephritis with pregnancy the alkalinity was about the same as in a normal pregnancy.

2. The total nitrogen was estimated by Kjeldahl's method, the urea by the sodium hypobromite method, and the ammonia by Schlosing's method. In 9 cases of toxæmia the ammonia coefficient was high, the urea coefficient low, and the quantity of undetermined nitrogen large. In 6 cases of chronic nephritis there was not much change in the ammonia coefficient.

3. Acetone and diacetic acid were found in all cases of marked toxæmia of pregnancy, and in no cases of normal pregnancy. In 10 cases of chronic nephritis no acetone was shown, and no diacetic acid, but 5 cases had an acetonuria with diacetic acid, the result of a supervening toxæmia of pregnancy.

4. The amount of sodium bicarbonate necessary to render the urine alkaline was found to be high in the toxæmic cases.

The conclusions drawn by the author are as follows: "From the evidence before us we are justified in concluding that a condition of acidosis is usually associated with pregnancy toxæmia. In the earlier and slighter cases the tests applied failed to demonstrate the presence of an acidosis, and in a severe case of eclampsia recently under my care a similar negative result was obtained.

"This case has convinced me that further investigations are required and that certain conditions, with which as yet we are very imperfectly acquainted, must be ascertained before we can definitely establish the relationship existing between pregnancy toxæmia and acidosis.

"I do not believe that the symptoms of toxæmia are due to acidosis; indeed these results definitely disprove this theory, because the symptoms are often present in a mild form before any evidence of acidosis can be found, but the results of treatment have convinced me that if we diminish the acidosis we alleviate the severity of the symptoms. In severe cases of eclampsia I have seen marked improvement follow intravenous infusion of solutions of sodium acetate and sodium bicarbonate."

In regard to treatment the author believes that chloroform should never be administered in cases of pregnancy toxæmia; that calomel and mercuric douches should never be given; that fat metabolism should be spared by the administration of glucose; and that when a pregnant woman suffering from chronic nephritis shows evidence of acidosis, the uterine contents should be evacuated. D. H. BOYD.

**Boero, E. A.: Late Conservative Cæsarean Operation with a Vertex Presentation for Cicatricial Atresia of the Vagina** (Operacion cesárea conservadora tardia con vertice encajado por atropsia cicatrizal de la vagina). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 561.

Boero's case was in a woman of 28, the history showing an abortion after one month in a previous pregnancy. The vagina was very narrow and fibrous, 7 to 8 cm. long,  $\frac{3}{4}$  cm. wide and inelastic. Labor pains began at 6 p.m. Four hours later the vagina only with difficulty allowed the passage of three fingers. By 3:30 a.m. it was clearly seen that the atresia was such that it would be impossible for the foetus to pass through the vagina. A conservative cæsarean operation was decided upon as it was recognized that the conditions were such as to permit satisfactory post-operative lochial drainage. The operation and after-course were satisfactory and mother and child left the hospital in good condition.

All reported cases of cicatricial atresia, in which operative intervention has been made, have according to Bar and others given a mortality of 43 per cent in 130 cases. Conservative cæsarean operation in 24 cases under similar conditions has given a mortality of 41 per cent.

If the caliber of the vagina is very narrow, if the uterine neck has not been effaced already for atresia or for any other cause, the post-cæsarean lochial retention is a grave consequence which as well as in cases where an amniotic infection exists imposes a subtotal hysterectomy or a Porro operation; if, on the contrary, the clear state of the vagina and the uterine neck permits the hope of a good drainage in a conservative cæsarean, if the



conditions which are necessary exist it should be given the preference. These conditions existed in the case reported.

W. A. BRENNAN.

**Harrar, J. A.: Post-Mortem Cæsarean Section; a Report of Ten Cases.** *Am. J. Obst., N. Y.*, 1916, lxxxiii, 1046.

The author gives a brief review of the literature on this interesting subject and a brief history of ten cases from the New York Lying-in Hospital.

In the series reported three babies were stillborn. It is probable that the death of all these children occurred before the death of the mother. Four babies were born with hearts feebly beating, but there was no attempt at respiration during prolonged efforts at resuscitation. One baby gave a few feeble gasps and died shortly after delivery. One baby, slightly asphyxiated at birth, died on the sixth day of pneumonia. One baby, badly asphyxiated at birth, left the hospital living and well; and one, crying spontaneously at delivery, was also discharged living and well.

C. H. DAVIS.

**Sonnenburg, C. N.: Cæsarean Section Performed with a Pocket Knife After Death of Mother, Resulting in Normal and Living Child.** *Indianapolis M. J.*, 1916, xix, 240.

The patient had had two uneventful previous pregnancies and no miscarriages. She had marked arteriosclerosis with blood-pressure varying during her pregnancy from 180, s, to 210, s. The urine contained no albumin or casts. Two days before entering the hospital there was oedema of the lower extremities which continued. There was evidence of congestion of both lungs. Endocarditis, myocarditis, and acute dilatation were observed. One morning she had a pulmonary hæmorrhage and before the author could reach her, she died.

So much time had elapsed in the effort to restore the patient that Sonnenburg feared to wait for the instruments and so performed a cæsarean section with a pearl-handled knife, 5.5 inches in length with a 2.5-inch blade. The baby girl was resuscitated in four minutes and has been gaining in weight rapidly. It was a full-term infant, weighed seven and one-half pounds, and was normal in all respects.

EDWARD L. CORNELL.

**Waegeli, C.: Interstitial Pregnancy** (*La grossesse interstitielle*). *Rev. de gynéc. et de chir. abd.*, 1916, xxiii, 405, 441.

Interstitial pregnancy is rare and Waegeli, in a very extensive research of the literature on the subject, has been able to collect only 150 cases, and of these many are very doubtful as both the macroscopic and microscopic descriptions are either lacking or incomplete. On this account Waegeli rejects 38 cases. Of the remaining 112 cases, many do not on examination satisfy the elementary postulates concerning which most authors are agreed and such cases if admitted must be taken on faith rather than on the evidence submitted by them.

The interpretation of an interstitial pregnancy is always difficult. It can easily be confounded with an angular pregnancy, with that in a rudimentary uterine cornua, or with a tubal isthmic pregnancy. From these considerations and from lack of satisfactory internal evidence Waegeli reduces the number of cases of genuine interstitial pregnancy reported in the literature to 53.

He describes with great detail and exactness the macro- and microscopical features of two cases which came under his observation in the Gynecological Clinic of the University of Geneva. In both cases the macroscopical and microscopical findings demonstrated clearly the development of a left interstitial pregnancy.

In the first case, the uterine fundus was strongly inclined (sign of Ruge-Simon), the left round ligament laterally inserted, and there was asymmetry of the insertion of the adnexæ, the left being much higher than the right. The foetal cavity is clearly separated from the uterine cavity, the hernia of the uterine caducous into the foetal sac showed that this caducous did not continue any part directly with an analogous formation in the ovular cavity. Sections from the tube show that there is no sign of an ovular graft. The greater part of its interstitial portions has no connection whatever with the ovular sac. All the evidence is in favor of a clear intramuscular or intramural insertion of the ovule and not intratubal or intracanicular. The foetal sac is developed in the muscular tissue itself. Neither does the microscopic examination show the least sign whatever of any inflammatory process in either tube.

In the second case the macroscopic and microscopic findings, which were almost identical in character, also establish the development of a left interstitial pregnancy. A muscular septum several millimeters thick separated the uterine and foetal cavities; sections of the left tube in the vicinity of the foetal sac show the complete absence of ovular graft. The uterine fundus is quite vertical and the left adnexæ are almost 5 cm. higher than the right. It is quite clear in this case also that the ovule is inserted in the muscular wall surrounding the tube but not in the tubal canal itself, and the wall of the foetal sac shows clearly that it is constituted entirely of muscular tissue.

From a further study of the cases Waegeli thinks that the irruptions of the chorial villusities and their epithelium into the wall of the foetal sac does not occur during the early period of pregnancy and not until it is two or three months advanced.

In the second part of his extensive study Waegeli, from a consideration of his own cases and the details furnished by others, endeavors to build up a complete clinical picture of interstitial pregnancy. After full consideration of the various classifications of other authors he finally classifies this affection in the following manner:

1. Interstitial pregnancy, intramural or paramural: (a) with evolution against the uterine



serous; (b) with evolution against the uterine cavity; (c) with evolution in the two above-stated directions.

2. Canalicular interstitial pregnancy. This classification will, according to Waegeli, include every reported case.

Waegeli thinks that the etiology of interstitial pregnancy is the most obscure chapter in the history of the affection. Having considered the various etiological theories submitted he declines to express any opinion in favor of one or the other. The truth is probably that different anomalies of the uterus and adnexæ concur to facilitate the interstitial insertion of the ovule. Today we are scarcely more advanced than Velpeau, who in 1831 wrote that the mechanism of interstitial pregnancy was still totally unknown.

The symptoms and signs of an interstitial pregnancy are rarely distinguishable before operation or resolution. The pregnancy most frequently ends by rupture, this occurring in the majority of recorded cases from the second to the fourth month, although it may extend to the seventh month. But in rare cases the resolution of the pregnancy may be by a uterine abortion of the complete ovule or by an incomplete uterine abortion. This latter has occurred in four of the recorded cases. However, the pathological anatomy is characteristic. Macroscopically there is a round tumor in the corresponding uterine cornua. This tumor contains the foetal sac inserted in the paratubal musculature. A direct consequence of its development is the separation of the insertions of the round ligament from the ovarian and tubal ligaments. A muscular wall formed between the uterine muscular septum was found to exist in 25 of the cases recorded. The absence of such a septum implies a canalicular interstitial pregnancy with uterine evolution.

But perhaps the most characteristic sign is the extraordinary position assumed by the uterine fundus. This becomes more and more inclined until it is almost if not quite vertical. Some authors, however, dispute the pathognomonic value of this sign. In the cases collected by Waegeli, the sign was present in 33, it was not present in 5, and its presence was not indicated in 15. It was present in both the author's personal cases. While this sign is present in the majority of cases its absence cannot be held to be a criterion of disqualification.

Waegeli discusses the other macroscopic concomitants of interstitial pregnancy: the insertion of the round ligament in laterality of the foetal sac; modification in position of the adnexæ. Interstitial pregnancy is accompanied by a characteristic asymmetry of the tubes, that on the gravid side in the immense majority of cases being higher than the other.

In the microscopic anatomy the question which dominates all others is that of the formation of caducous in the foetal interstitial cavity. Opinions on this are well divided and Waegeli discusses the various arguments without arriving at any very definite conclusions.

The clinical diagnosis, prognosis, and treatment are finally discussed. In the statistics it is shown that in 9 cases where intervention was made before rupture all recovered. Twenty-nine which were operated upon after rupture gave a mortality of 27.5 per cent. The operation of choice is the excision of the gravid uterine cornua and the corresponding tube. Total hysterectomy is indicated only if there is infection. The rule adopted by the author is to immediately operate upon every case of interstitial pregnancy when such a diagnosis is made; moreover, it is absolutely necessary to intervene even in cases where an interstitial pregnancy is only suspected. The dangers of an immediate laparotomy are far less serious than those occurring from a delay which may at any moment result in a fatality.

W. A. BRENNAN.

**Falls, F. H.:** Blood Ferments in Pregnancy. *Illinois M. J.*, 1916, xxx, 22.

The author believes the following conclusions express the attitude of most workers toward the Abderhalden test:

1. The Abderhalden test is not a specific and infallible test for the diagnosis of pregnancy, cancer, or any other condition.

2. A negative reaction in a given case is of great value as speaking against the possibility of pregnancy.

3. A positive reaction must be interpreted as only speaking for the diagnosis of pregnancy, and that only in absence of a large number of pathologic conditions to some of which attention has already been called.

4. The ferments are increased in the blood during pregnancy. As yet, however, no way has been devised of differentiating between these ferments and the ferments mobilized in many pathologic conditions.

5. The test should be done in all cases in which the diagnosis of pregnancy is in doubt with a full knowledge of its limitations and possible errors. It should be regarded as corroborative evidence together with other clinical phenomena.

D. H. BOYD.

**Kraus, H. A.:** Pregnancy Complicated by Syphilis. *Illinois M. J.*, 1916, xxx, 18.

If a woman has a genital chancre at the time of conception, or shortly after, its course is often protracted, and the ulcerations are deeper and more extensive than usual. Secondary lesions and subjective symptoms are often aggravated.

Syphilis is a frequent cause of abortion and premature delivery especially between the sixth and eighth months. In the majority of cases miscarriages are caused by the death of the foetus.

The effect of syphilis on the ovum varies. The child may be born healthy and remain so or it may develop signs of syphilis in three to six weeks, or it may show distinctive signs at birth. Other symptoms may appear which are the result of disease (hæmorrhage, jaundice, etc.). The child may



show various congenital malformations, or it may die before birth, and characteristic lesions may or may not be shown in the placenta, following abortion.

Early treatment must be instituted before the middle period of pregnancy. A mixed treatment of mercury and arsenic is advised. Children born without lesions and a negative Wassermann should be treated. The author uses a daily injection of some soluble salt of mercury, increasing the amount to the point of salivation. A weekly intravenous injection of 0.1 grain of neosalvarsan is given with the mercury. D. H. BOYD.

**Smead, L. F.: Gunshot Wounds of the Abdomen in Pregnant Women.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

The author reports the case of a pregnant woman shot through the abdomen, both mother and child recovering. The bullet perforated the colon and the uterus of the mother, the placenta, and the child's hand.

Gunshot wounds of the abdomen are more dangerous during pregnancy than at other times. The abdomen should be opened in all cases if possible. The uterus at full term should be emptied by cesarean section and at earlier periods if the organ is badly injured. A uterus during labor is likely to spread any infection which is free in the abdomen and a pregnant uterus is therefore a menace to the patient if peritonitis develops.

The uterus is usually emptied by cesarean section or hysterotomy because the abdomen is open.

Hysterectomy is usually not indicated in gunshot wounds of the abdomen unless the uterus is badly lacerated.

Drainage should always be used in these cases and irrigation very rarely.

About thirty cases of gunshot wounds of the abdomen in pregnant women are cited.

#### LABOR AND ITS COMPLICATIONS

**Freeland, J. R.: Scopolamine-Morphine Anæsthesia in Labor; a Report of Seven Years' Experience.** *Penn. M. J.*, 1916, xix, 768.

The author uses Merck's scopolamine. He thinks it advisable to confine oneself to one preparation when contradictory results have been obtained by various investigators.

The author's method of administration is the one usually adopted except that he eliminates much of the mental suggestion that is associated with darkened rooms, softly stepping attendants, whispered orders, cotton in the patient's ears, etc. In his opinion, too dark a room interferes with observation of the patient. A dimly lighted but not gloomy room, free from extraneous noises and interruptions, adds to the effectiveness of the drug, but, carried to the extreme and associated with the other elements of suggestion already mentioned, creates an atmosphere potentially harmful to patients in the receptive mental state caused by scopolamine.

Therefore, all movements, conversation, and manipulations are carried out in a natural manner and not with the hushed, mysterious air of mutes at a funeral or assistants at a magician's entertainment.

Great capital has been made out of the popular belief that a specially equipped hospital is necessary for deriving the greatest benefit from scopolamine. This is, of course, a nonsensical contention. With a trained nurse capable of counting the foetal heart-beat and conversant with the care of patients who have been anæsthetized for any purpose, the average home offers the atmosphere of quiet that is claimed to be a necessity. In this one respect the best-equipped hospital in the world has no advantage over the quiet bedroom to which the patient is accustomed.

Regarding the effect on the child, it has been claimed that a condition of apnoea frequently follows the use of scopolamine. The author's results show this to be no more frequent than after any other anæsthetic, and it is much more likely to be caused by morphine than by scopolamine. Resuscitation of asphyxiated infants was not required oftener in the scopolamine than in the other cases.

There were no children born alive who died because of failure of resuscitation, except one case of cerebral hæmorrhage, the diagnosis being confirmed by autopsy. The foetal mortality in 410 cases was 8, or 2 per cent, excluding four children that were macerated. The causes of death in the stillborn infants were: cerebral hæmorrhage 2; cord around neck 1; cause unknown as no autopsy was allowed 3. Two died after delivery, one from stenosis of the larynx and one from cerebral hæmorrhage, both diagnoses being confirmed by autopsy.

As to the effect on the duration of labor, in 236 primiparæ the average duration of labor was twenty-two and one-sixth hours. These patients were of all ages.

There is one type of cases in which scopolamine does delay labor and increase the frequency of forceps application, that is, those patients in whom it produces delirium and uncontrollable restlessness.

One point should always be remembered in connection with the question of the duration of labor and that is that a sedative is most needed by patients in whom labor is prolonged and will most often be used in cases of this type to the detriment of the reputation of whatever sedative is used if unqualified statistics are presented. The patients who have short quiet labors require no anæsthetic and so lower the average duration of labor in their particular group. On the other hand, scopolamine, if useful at all, is useful in cases of inertia and extreme susceptibility to pain.

As regards the occurrence of abnormalities, those in the author's series comprise: forceps 66, or 16 per cent; breech 9, or 2.02 per cent; face 3; post-partum hæmorrhage 4, or 1 per cent; contracted pelvis 7; persistent occipitoposterior position 6; acute chorea 1; chronic chorea 1; eclampsia 6; epilepsy 5; pyelitis 2; pulmonary tuberculosis 2; lobar pneumonia 1;

exophthalmic goiter 1; heart-disease 2; syphilis 3; and hydatidiform mole 1. None of these can be said to have been caused by the use of scopolamine.

Regarding the effect on the consciousness of pain and the effect on the mind of the mother, the author's results were as follows: (1) complete relief of pain and amnesia 64, or 15.5 per cent; (2) great relief of pain, sleep between, patient waking during height of contraction 236, or 57.5 per cent; (3) marked relief, but no sleep 69, or 17 per cent; (4) no effect 41, or 10 per cent; (5) delirium 5 cases.

In considering these results and the low percentage of occurrence of amnesia, one point needs emphasis. The author never deliberately pushes the drug with the object of obtaining amnesia, but uses it with the idea that its object is accomplished if the patient sleeps between pains and awakens during them. The harmful effects so often obtained result from endeavoring to get amnesia in all cases.

The author suggests that scopolamine be withheld if the patient shows any marked reaction on the stimulative side, such as delirium, inconsequential talk, or even the well-known atropine flush which often appears after the first dose in those patients in whom a second dose causes delirium.

The conclusions are: (1) Scopolamine is a useful sedative, not anæsthetic, when not pushed to the extreme of physiologic tolerance. (2) Under these conditions it is without danger to the child. (3) It does not have a retarding influence upon the progress of labor. (4) Suggestion should be avoided. (5) Injurious mental results can and do commonly occur and care should be taken to avoid its use in patients whose make-up suggests such possibilities.

EDWARD L. CORNELL.

**Valens, J. A.: Pituitrin in Labor.** *West. M. News*, 1916, viii, 123.

The author draws the following conclusions as to the use of pituitrin in labor:

1. It enables the doctor to use a general anæsthetic to lessen the suffering of the patient, in many cases where he could not otherwise give it on account of stopping the progress of the confinement. Pituitrin stimulates the contractions, hastens the progress of the delivery and, at the same time, allows the use of a general anæsthetic. This, in the author's opinion, makes pituitrin one of the greatest medicines discovered in later years.

2. It should not be given without a general anæsthetic, unless in very small doses, and even then it is preferable that an anæsthetic be given.

3. The size of the dose should be governed by the condition of the case.

4. In opposition to many writers, the author believes the extract of the pituitary has a large place in so-called normal labors.

5. He has never seen any asphyxia or any sign of severe compression of the foetus in connection with its use.

6. The extract produces strong intermittent contractions, the contractions often prolonged above

the normal, especially when a large dose is given. Labor seems to retain its physiological character.

7. No sign of tetanic uterine contractions occurred in any of the author's cases.

8. Used in only one case of miscarriage of two months' standing to expel the placenta, it had no effect whatever.

9. No sign of any rupture of the uterus was noted but the author believes it might possibly occur in cases of obstruction with too large a dose of the extract.

10. Action begins in from three to five minutes and lasts from twenty to forty minutes.

D. H. BOYD.

# MISCELLANEOUS

**Gandino, N. T. F. de.: A Case of Intra-uterine Crying** (Un case de grito intra-uterine). *Prensa méd.*, Argent., 1916, iii, 35.

Intra-uterine crying is such a marvelous phenomenon that its existence is denied by many who have never had the occasion of observing it.

The interruption of the circulation of the umbilical cord causes the foetal blood to become venous. This causes an excitation which produces reflexly an inspiration and an expiration; this latter if the vocal cords are tense can determine the cry.

The case cited was noted by Gandino in 1912. The woman was a multipara who had four pregnancies terminating at term. The fifth was a twin pregnancy; the first foetus was stillborn; the rupture of the second bag of water took place a few days later and it was at that time that the intra-uterine cry could be heard and it was repeated when the forceps were introduced to terminate the labor. The foetal cry was similar to that of a suffocating person.

In the discussion several speakers gave their opinion regarding the unquestionable occurrence of intra-uterine crying and urged that this case be put on record.

W. A. BRENNAN.

**Hymanson, A., and Kahn, M.: Lipoid Content of Maternal and Foetal Blood.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 1041.

After a general discussion of this subject with a description of the technique used in their tests the authors conclude as follows:

The data from their experiments carried out show that on an average the total lipid content of the maternal blood is less than the total lipid content of the newborn infant's blood, the figures being respectively 4.75 and 4.8 parts of fat per thousand parts of blood. The cholesterol content, on the other hand, shows, in general, the opposite state of affairs; i. e., 2.1 parts of cholesterol per thousand parts of infants' blood and 2.19 cholesterol per thousand parts of maternal blood.

The authors believe that the chorionic villi have the function of discriminating which part and how much of each lipid shall pass into the foetal circulation.

C. H. DAVIS.



**DeLee, J. B.: A Bacteriologic Study of the Causes of Some Stillbirths; Preliminary Report.** *J. Am. M. Ass.*, 1916, lxxvii, 344.

Thirteen years ago the author saw a child of a healthy mother born with a temperature of  $101^{\circ}$ , which within a few hours rose to  $103^{\circ}$ . The child died of streptococcic septicæmia, the mother showing no signs of infection. A year later, a physician's wife, after a mild pharyngitis, developed albuminuria and eclampsia. Artificial delivery was performed. Out of the child's nostrils pure pus exuded. The pneumococcus was found in it. Several other cases have indicated that the child can become ill, independently of its mother and may even die, the mother being only indirectly affected or not at all.

This opens up an immense field for study that we may thus find the cause of many cases of so-called "habitual abortion" and repeated "premature labor after viability and before term," and that we may discover new problems of immunity, focal infections, nephritis during pregnancy, eclampsia, puerperal sepsis, blood-borne transmissions, and new aspects of the transmutations of bacteria.

EDWARD L. CORNELL.

**Decref: A Case of Obstetrical Paralysis** (Un caso de parálisis obstétrica). *Siglo méd.*, 1916, lxiii, 380.

The case is reported of an infant of two months which at birth did not move the right arm. The family physician stated that the birth had been protracted and that axillar traction was necessitated.

This traction occasioned traumatic lesions of the shoulder, resulting in the arm being completely pendulous and absolutely immobilized.

In these cases Decref avails himself of Gaugele's procedure which is to place the shoulder in a position of extension abduction and external rotation, forming a right angle with the arm. This position is maintained by means of a ring which takes the form of a banneret at the end of a pole and which serves also to keep the arm in the position indicated.

After 15 days more or less movement begins to be noted, since there is a restitution of the articular elements. Reduction alone, as in this case, suffices generally for complete restitution. If the immobility has occasioned trophic or degenerative lesions electrotherapy is indicated.

W. A. BRENNAN.

**Thomas, T. T.: Obstetrical or Brachial Birth Palsy.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 577.

The author reports 11 cases of brachial birth palsy and gives an interesting review of the litera-

ture together with his views regarding the etiology and treatment of this condition. He rejects the plexus theory for most cases.

His interest in obstetrical palsies resulted from observations on adult brachial palsies from injuries to the shoulder region. He claims that a palsy, due to injury to the shoulder region and associated with an ankylosis of the shoulder-joint, which disappears with the restoration of normal motion to the shoulder-joint, must be due to an injury to that joint. He believes that this conception also applies to obstetrical palsies, and that the treatment based upon it is the best.

The author bases his treatment upon the simple principle of restoring as nearly as possible the normal function of the shoulder-joint. From an experience with 24 palsied arms in 23 patients, he found that when there was no displacement in the shoulder-joint a perfect recovery could be obtained from exercise alone. In all of his cases of birth palsy with the typical internal rotation of the limb and the characteristic limitation of abduction and external rotation as old as two or three years he has not yet failed to find present a posterior subluxation of the shoulder-joint.

The strongest evidence of a traumatic origin at birth of these subluxations is the bending downward and forward of the anterior portion of the acromion which is practically always present. An injury to the brachial plexus cannot explain it. It is obviously due to the same pressure which pushed the humeral head backward during delivery. X-ray will not show the bent portion of the acromion as the patients are too young. However, he has found it by operation every time, except on a patient in whom the acromion showed distinct evidence of pressure. The absence of the normal humeral prominence under the posterior edge of the acromion and the bending downward and forward of the anterior portion of the acromion will establish the diagnosis of a posterior subluxation. It is important to recognize it at or soon after birth and its diagnosis is so difficult then, for the reasons already given, that he does not hesitate to mildly etherize the young patient in order to assure the diagnosis. In doubtful cases he takes advantage of the anæsthetic to make sure the humeral head is in good position and fix it there for six weeks by a light cast with the arm in abduction and external rotation.

Operative reduction of these dislocations is in its infancy and as yet no method of operation has received much attention.

C. H. DAVIS.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Payne, R. L., Jr.: Unilateral Hæmaturia Associated with Fibrosis and a Multiple Microscopic Calculi of the Renal Papillæ.** *Surg., Gynec. & Obst.*, 1916, xxiii, 76.

Reference is made to previous experimental work by the author in which acutely developing vascular lesions were eliminated as a cause of symptomless unilateral renal hæmorrhage.

The author then reports a case of symptomless unilateral hæmaturia in which bisection of the kidney showed microscopically a normal cortex and parenchyma but every papillæ presented a cherry red appearance typical of angioma.

The kidney was removed and careful microscopic studies disclosed an absence of pathological findings in the cortex or parenchyma proper, but the papillæ showed definite chronic inflammatory changes.

These changes consisted of (1) an overgrowth of connective tissue, (2) multiple microscopic calculi, (3) dilated capillaries with the small calculi in close apposition or the capillaries surrounded by the connective-tissue proliferation, (4) a network of dilated capillaries on the surface of the papillæ, many of which were ruptured with free blood escaping.

These numerous though small varices were evidently the source of the hæmorrhage, and the inference is that the numerous calculi, aided by the connective tissue they had originated, succeeded in causing an obstruction to the venous return with a subsequent dilatation of the capillaries and resulting varicosities.

The paper is illustrated with microphotographs showing the microscopic calculi, the connective-tissue proliferation, and numerous dilated capillaries which have ruptured on the surface of the papillæ with free blood escaping.

The author claims that this is the first case recorded in which there is definitely shown the cause and source of a symptomless unilateral hæmaturia.

The facts presented would lend further weight to the contention of those who believe chronic inflammation to be the cause of unilateral renal hæmorrhage.

**Bissell, D.: Surgical Replacement of the Pro-lapsed Kidney.** *Surg., Gynec. & Obst.*, 1916, xxiii, 100.

The approach to the kidney advocated is by exact dissection of the tissues in the lumbar region occasioning the least trauma, or injury, to the tissues encountered, at the same time facilitating deep manipulation in delivering the kidney.

The skin incision is four inches — beginning at a point immediately above the angle formed by the lost rib and the erector spinæ and extending to a point immediately above Petit's triangle. The terminal fibers of the latissimus dorsi are now incised along the line of their attachment to the erector spinæ and the muscle is transferred to the center margin of the wound. An incision is next made in the upper area or superior triangle of the lumbar fascia immediately below and parallel with the twelfth rib; this incision being extended inward and outward as far as may be found necessary. The last dorsal nerve is usually found to the inner side of this incision. The kidney is then directly approached by blunt dissection through the fatty capsule. The finger is hooked into the cellular tissue about one of the poles, preferably the upper, and the organ delivered. The fatty capsule is completely freed from its attachments to the kidney and a crescentic incision of the fibrous capsule is made on the posterior surface extending almost from pole to pole and to within 1 cm. of the hilum. Two sustaining sutures of vegetable dyed silkworm gut are passed completely around the poles penetrating the attached portion of the fibrous capsule at several points to fix their position. When the kidney is replaced these sutures are passed through muscle, fascia, and skin and tied over a bolster of iodoform gauze.

The apron, or shield, formed by the crescentic portion of the fibrous capsule separated from the posterior surface of the kidney, is sutured to the under surface of the lumbar fascia to prevent the fatty capsule, which is not removed but forced anteriorly, from wedging between the raw posterior surface of the kidney and the sheath of the quadratus lumborum. The fascial incision is closed with a continuous suture of plain catgut No. 1. The latissimus dorsi is sutured to its original position with plain catgut No. 1. The skin should always be united with a permanent suture as the edges of the upper portion will separate by pressure from the bolster of gauze if the suture material is soluble. The silkworm gut sutures are tied on the inner side of the loops on the nineteenth day after operation and the patient is allowed to get out of bed immediately. The sutures are removed any time within the next two days.

**Abell, I.: Giant Ureteral Calculus; Anomalous Development of the Genito-Urinary Tract.** *Surg., Gynec. & Obst.*, 1916, xxiii, 33.

The case reported was that of a male, white, aged 32, whose personal history was negative for acute severe illness and venereal infection. The patient



applied for relief of "pain in his back" of ten days' duration. Irregular left lumbar pain was first noted at 18; at 28 similar pain was noted on the right side. Latterly pain recurred monthly, never sufficiently severe to require opiates, and until the present attack persisting only a day or two. Heretofore relief had been afforded by rest, hot baths, hot water-bottle, etc. Between paroxysms there was urinary frequency four to five times daily, during an attack once to twice daily. Blood was noted in the urine on a number of occasions.

The patient was thin, but well-developed and muscular; pulse 100; temperature 100.2° F.; heart and lungs normal; right kidney palpable, tender, apparently as large as a medium-sized grape fruit. The left kidney not palpable; no tenderness on that side. The urine was a muddy color, acid, s. g. 1.020; marked trace of albumin; occasional blood and pus cells; calcium oxalate crystals; amorphous phosphates; moderate number of bacteria.

Cystoscopy showed that the bladder was practically normal; the left ureteral orifice appeared normal; the catheter readily entered the renal pelvis. The orifice of the right ureter was oedematous; the catheter encountered obstruction at 2.5 cm. The urine from the left kidney showed no albumin nor pus; an occasional blood-cell; blood count normal.

Radiography of the calculous pelvic portion of each ureter showed the left to be of moderate size, the right extended from the sacro-iliac joint to the meatus. The diagnosis was: bilateral ureteral calculi, right-sided hydronephrosis.

The operation consisted of a bilateral gridiron incision, enlarged downward by incising the rectus sheath; the peritoneum was displaced mesially; the ureters were approached extraperitoneally. There was considerable thickening about the right ureter, and it was separated with difficulty from the surrounding structures. The ureter was incised at the pelvic brim, and the calculus removed by traction. After a similar procedure on the left side, the ureteral incisions were closed by interrupted catgut. The external wounds were drained by strips of rubber sheeting.

The post-operative history was uneventful, the patient resuming work at the end of the third week. The right calculus was oblong with a distinct curve at either extremity, length 7.5 cm., circumference 7 cm., weight 24 grams; the left stone was more ovoid, weight 2 grams.

The literature shows that Desguin removed ureteral calculus, irregularly triangular, 26 by 23 mm., weighing 10 grams; Baker, 94 grains; Parker, over ¾ ounce; Bovée, 2¾ by 1¾ by 1½ inches, weight 1,310 grains; Buerger, (1) more than four inches long, 6 mm. to 1 cm. in diameter, (2) 2½ inches long by 1½ inches wide; Specklin, 11 cm. long, weight 51 grams; Federoff, length 19 cm., weight 52 grams; Røvsing, length 18 cm., width of a bean; Israel, (1) length 13 cm., circumference 9 cm., weight 54.4 grams, (2) length 17 cm., circumference 9 cm.; Pozzi, weight 34.5 grams;

Lloyd, length 5.5 inches, circumference 2.5 inches; Morris nearly 6 inches long; Gibbon, ½ inch in diameter, nearly round.

The second case occurred in a female, white, aged nineteen, who had been married three years, with no pregnancy nor menstruation. The first attack was diagnosed as appendicitis. When the second attack occurred the patient was taken to the hospital. Her pulse was 120; temperature 103° F.; abdomen markedly distended, exquisite tenderness in the lower zone. While her figure was typically feminine, examination revealed the absence of a vagina; the external genitals were normal in appearance. The urine was acid, trace of albumin; slight sediment; few blood-cells; many pus-cells; and rod-shaped bacilli. The blood count showed: hæmoglobin 90 per cent, white cells 30,500, polynuclears 82 per cent. The tender mass in the left pelvis was thought to be retained and infected menstrual secretion.

Cœliotomy with median incision disclosed a pelvic kidney in front and to the left of the sacro-iliac synchondrosis. The right kidney, uterus, tubes, and ovaries were absent. The appendix was removed. The operative finding was pyelitis in a single pelvic kidney.

Three weeks later urine from the ureter and the bladder was negative upon culture. Radiography showed the renal pelvis to be normal in size and shape, with a single ureter three or four inches long. A cystogram showed the bladder pressing upon the kidney, the latter producing a variation in the normal vesical outline. The rectum was in the right pelvis.

In the literature, Anders cites one case of single kidney, based upon 92,690 autopsies the occurrence of the anomaly was one in 1,817. He refers to 285 cases in the literature. Among 36 gross renal and ureteral anomalies in the Mayo clinic during five years, 12 were horseshoe and 6 single type. Thomas reports a case of pelvic kidney in a female diagnosed prior to operation for pelvic disease; the vagina and uterus absent. Cullen mentions a case of a girl of seventeen with right pelvic kidney; vagina, uterus, and left kidney absent; tubes and ovaries prolapsed in the inguinal region. Bissell successfully reimplanted a right pelvic kidney. A single kidney has been observed at autopsy by Ward, Glazebrook, Secher, Stengel, and others. Polk removed a single right kidney located in the pelvis, the patient perishing after thirteen days of complete anuria. Mayer and Nelkin speak of subparietal traumatic rupture of a solitary right kidney.

#### BLADDER, URETHRA, AND PENIS

Granger, A.: The Use of Oxygen in Cystography, with a Preliminary Report on the Use of Oxygen in Pyelography. *Am. J. Roentgenol.*, 1916, iii, 351.

Beginning in 1909 the author began using washed and filtered air to distend the urinary bladder in an effort to obtain better cystographs, but found it was

not well borne, causing pain and tenesmus. Oxygen was substituted and found very satisfactory, permitting greater distention without pain. The outline of the bladder and prostate, growths, diverticula, adhesions, or infiltrations show up clearly.

In making the cystographs the bladder is emptied of urine and then distended slowly with oxygen to about two pounds intravesicular pressure, when the catheter is withdrawn, the thighs elevated, and "the tube-holder tilted to an angle which will cause the normal ray to pass from behind forward through the middle of the lower half of the sacrum."

In the use of oxygen in pyelography the author's technique is as follows:

1. The patient is cystoscoped and the ureteral catheter inserted.
2. The solution is withdrawn and the cystoscope removed without disturbing the catheters.
3. A very small ureteral catheter is introduced into the bladder and the bladder filled with oxygen.
4. The catheter is removed without disturbing the ureteral catheters.
5. The ureteral catheters being connected with the oxygen equipment, gas is allowed to flow and the exposure made while the gas is flowing in.

It is important to distend the bladder at a slightly higher pressure than the pelvis and ureters to prevent leakage into the bladder. H. W. PLAGGEMEYER.

**Quain, E. P.: Rupture of Bladder Associated with Fracture of Pelvis.** *Surg., Gynec. & Obst.*, 1916, xxiii, 55.

Immediate mortality is higher in intraperitoneal than in extraperitoneal rupture of the bladder, but the patients who recover from the latter are more apt to suffer permanent disability than those who recover from the former. This is due chiefly to the urinary extravasation about the base of the bladder, which induces infection, necrosis, and loss of function. Another cause is fracture of the pelvis, which is shown by statistics to be the most serious complication of bladder rupture.

Treatment for the vesical tear consists in drainage of the bladder either infra- or suprapubically, suture of the laceration being of lesser importance in extraperitoneal cases. Open operation, wiring, etc., for pelvic fracture is unsatisfactory because of urinary infiltration. The author found indirect fixation by external screws and clamps useful in the case of a boy of 16 injured in a runaway. There was a wide separation of the symphysis pubis and left sacro-iliac synchondrosis, associated with a laceration encircling two-thirds of the neck of the bladder. The laceration extended into the rectum and through the skin in the perineum. The bladder and rectal wounds were sutured and a retention catheter left in the urethra. External fixation of the bone fragments by the insertion of a Freeman's screw on either side of the symphysis pubis held the bones in apposition until fibrous union was established. The patient was able to walk and leave the hospital after nine weeks' treatment.

A synopsis of 126 reported cases of rupture of the bladder associated with fracture of the pelvis is submitted.

**Heineck, A. P.: Herniæ of the Urinary Bladder.** *Chicago M. Recorder*, 1916, xxxviii, 342.

Hernia of the urinary bladder occurs in about 1 per cent of all herniæ. In the past through insufficient knowledge and failure to recognize bladder hernia fatal accidents have occurred, injury to the bladder wall resulting in peritonitis. The author has reviewed 164 cases reported in the literature and gives the following summary:

While occurring at all ages, the greatest number appear beyond the age of 40. Occurring somewhat more frequently on the right side, only five were bilateral. They occur more frequently in males. As to the type of hernia present, the great majority were inguinal. The proportion of indirect to direct was as three to one. In the series there were 40 femoral herniæ and 17 inguinal in females. Femoral hernia was much less common in males. Other forms were obturator and suprapubic herniæ. Some were definitely within the hernia sac, in others the sac was incomplete or absent. According to the type there may or may not be other contents of the hernia. Cases of incomplete or absent sac were by far the most common. HORACE BINNEY.

**Cifuentes, P.: A Case of Permeability of the Urachus** (Un caso de permeabilidad del uracho). *Siglo. méd.*, 1916, lxiii, 372.

Vesico-umbilical fistulæ due to complete permeability of the urachus are rare. Cabrol reported the first known case in 1550. According to Monod, 56 cases have been published up to 1900 to which some 14 or 15 more have since been added.

The author published the details of a case observed in his clinic, of incomplete congenital obliteration of the urachus in a man of 58. The details of the history are not very clear. The urinary troubles began about three years before, with frequent and painful urination. Recently pain had been felt in the hypogastric region, about the neighborhood of the median line. This inflamed, came to a head and pus and urine were evacuated.

On palpation a large induration could be made out extending from the outlet to the bladder. There was no urinary retention and the prostate was normal. The urine was turbid, and the patient had some fever.

The treatment adopted was transperitoneal extirpation of all the fistulous tract comprised between the orifice and the urachus. The condition of the patient continued to improve for some time but peritoneal complications arose and he died fourteen days after operation.

The author thinks that the question of intra- or extraperitoneal extirpation depends on the conditions in which the affection is met, the peritoneum being opened only when adhesions do not admit of the other procedure. W. A. BRENNAN.



**Loumeau: Traumatic Stricture of the Urethra by a Projectile with an Unexpected Trajectory** (Retrécissement traumatique de l'urètre par projectile de guerre à trajectoire inattendue). *J. de méd. de Bordeaux*, 1916, lxxvii, 96.

In the case reported by Loumeau the bullet entered the left buttock and came out by the lower wall of the penoscrotal urethra. This urethral wound allowed complete urinary passage. On cicatrization micturition became more and more difficult and painful and incontinence and foetid urine resulted.

Examination showed the canal to be permeable as far as the base of the penis where a cicatrized block opposed the passage of the finest bougie. External urethrotomy was done. Recovery was by secondary intention in about a month. About two months later stricture was again evident and progressive dilatation was resorted to, as the patient refused a new operation.

W. A. BRENNAN.

### GENITAL ORGANS

**White, E. W.: Seminal Vesiculitis.** *Urol. & Cutan. Rev.*, 1916, xx, 370.

The symptomatology of seminal vesiculitis is exceedingly voluminous.

The wide degree of variability of symptoms is due to the fact that vesiculitis in the true sense has no distinct entity, but is virtually associated with a prostatitis, colliculitis, or a posterior urethritis.

In the nervous types a neurotic element was found in 90 per cent of the long-standing cases. This element was probably due to persistent pain. The results were not gratifying following either conservative or operative treatment. The close proximity of the vesicles to the bladder explains the frequency of bladder symptoms.

Cystoscopy often reveals a seminal vesiculitis cystitis in which the mucosa of the bladder overlying the vesicles and trigone was hyperæmic and œdematous, readily accounting for the symptoms of irritable bladder neck, burning, and throbbing sensations, frequency, suprapubic tenderness, bladder tenesmus, and retention of urine. The majority have a persistent mucopurulent discharge.

Pain in the perineum may vary from slight discomfort to a sensation of dragging, drawing, fullness, and pressure; sensitive epididymes and drawing pains along the cord with recurrent attacks of epididymitis are common.

In the early stages, frequent erections with nocturnal pollutions are common. Later, gradual diminution of sexual strength and finally absolute loss of erections is noted. Painful orgasm, painful and incomplete erections, hæmospermia, pyospermia, etc., are common findings.

Blood and pus in the ejaculate or after massage are proof of seminal vesicle involvement and are worthy of surgical consideration. Improvement of sexual function following vesicle drainage is marked in these cases.

Many cases simulate acute appendicitis, urethritis,

ureteral colic, or stone. Abscess formation with perforation into the peritoneal cavity has been reported.

Pyæmia following septic phlebitis of adjacent venous plexus and pelvic cellulitis with suppuration are possible sequellæ. Dull, persistent suprapubic pain, constant pain in the lower lateral quadrants of the abdomen with a chronic urethral discharge should always suggest vesicle trouble.

As to the rectal and anal symptoms, rectal exploration will usually establish a diagnosis pathologically classified as follows:

1. The acute catarrhal type, in which the vesicles are soft and lost in folds of the rectum or greatly distended, tense, and exquisitely tender.
2. The fibrous or sclerotic type, in which the vesicles are firm or atonic, pain variable.
3. The suppurative type or abscess.
4. The pan-inflammatory type in which the prostate and vesicles are matted together in one inflammatory mass. This type is productive of pain referred to the hypogastrium, loins, anus, perineum, and sacro-iliac synchondrosis.

Joint symptoms are uncommon. Chronic infection may be harbored many years in the vesicles, periodically expressing septic material into the circulation. The synovial membranes are more easily involved due to their low resistance to invading organisms.

As regards operative intervention, the seminal vesicles have been attacked surgically first for the relief of pain, second for evacuation of pus, and third for the removal of hard fibrous vesicles of long standing producing much discomfort.

Undue haste need not be exercised in advising operation until palliative measures have been fully exhausted. Persistence in conservative treatment has been followed by recovery in many cases characterized by exacerbations. Other cases that failed of benefit by palliative treatment were cured by operation.

Vesiculectomy is the operation of choice in long-standing cases with sclerosis, while vesiculotomy has been satisfactory in pus and acute catarrhal forms.

The author summarizes the following as surgical possibilities:

1. Acute catarrhal with marked general and urinary symptoms.
2. Chronic fibrous, sclerotic, unrelieved by treatment.
3. Pus and blood after massage or in the ejaculate which persists.
4. Sexual neurasthenia with a progressive diminution of sexual strength.
5. Tuberculous vesicles.

Vasotomy as a preliminary step has given only temporarily gratifying results, particularly in cases complicated by recurrent epididymitis.

The author reports 7 cases, in 5 of which vesiculectomy was done and in 2 vesiculotomy.

Vesiculectomy is advised in all cases of multiple

abscesses with extensive destruction of tissues, long-standing cases of hard fibrous sclerotic vesicles, cases in which the vesicle and ampulla are producing symptoms referable to the ureter, and selected cases of extreme nervous origin unaltered by the usual treatment.

Vesiculotomy is considered in all cases of spermatorrhœa, all cases of pus and blood in the ejaculate and following massage, and in the acute catarrhal and suppurative types.

H. G. HAMER.

**Crowell, A. J.: Urinary Retention Due to Prostatic Obstruction.** *Urol. & Cutan. Rev.*, 1916, xx, 255.

In the first type of prostatic obstruction, prostatic abscess, the author believes that the prostate should be drained perineally without opening the urethra. In the second class of cases, prostatic hypertrophy, the author believes in perineal prostatectomy for the reason that the wound and the kidneys are both drained from the most dependent point, the perineum. He believes that the mortality following the perineal operation is not as great as that following the suprapubic. If the prostatic hypertrophy is accompanied by an abscess of the prostate, the abscess cavity also can be better drained through the perineum.

In malignant disease of the prostate attention is called to the fact that the prostate, its capsule, the seminal vesicles, and the bladder trigone can all be removed perineally. In performing this operation the growth may be entirely removed, the only drawback being that incontinence of urine usually ensues. He recounts two cases in which he has used the Young punch to remove a prostatic bar. In one case, a man of 82 who had a bad kidney function, 4 ounces of residual urine, and was in poor physical condition, the punch operation was entirely successful. In the next case, a man, 38 years of age, who had 16 ounces of residual urine, the median bar was removed by the punch. After the operation he was able to empty his bladder without difficulty.

B. S. BARRINGER.

**Gordon, G. S.: The Internal Sphincter Following Prostatectomy.** *Surg., Gynec. & Obst.*, 1916, xxii, 620.

After removal of adenomata through the internal sphincter the sphincter on regaining its full functional power often forms a raised crescentic fold which in ratio to its size obstructs urination, with the result that there still remains some abnormal back pressure at urination on the bladder, ureters, and kidneys which encourages the continuance of infection and interferes with renal excretion. Be-

hind this obstruction is a pouch of residual urine in which stone may form. If the free edge of the sphincter has been denuded and its purse-string action is strong enough it may obliterate the outlet entirely and contact healing may occur. The author believes the obstruction should be dealt with at operation and he suggests the entire removal of this flap or that it be slit and applied to the denuded prostate bed.

### MISCELLANEOUS

**Beck, E. G.: A Report of a Series of Unusual Fæcal and Genito-Urinary Cases Treated by Bismuth Paste.** *Surg., Gynec. & Obst.*, 1916, xxii, 507.

The author reports 38 cases, 17 post-operative fæcal fistulæ and 21 cases of urinary sinuses, all treated with bismuth injections. Most of these were preceded by more than one operation, some of them by as many as fifteen. Most of these cases were shown before the surgical society and the histories given in this paper must be read in order to learn the most essential points in technique in this treatment. It is only in this way that the best results may be obtained and Beck has shown what can be accomplished under proper conditions.

The stereoroentgenograms, which illustrate clinically the injection, are instructive both from a diagnostic and a therapeutic standpoint. It is shown that tuberculosis of the spine or the hip-joint may perforate the bladder and thus cause urinary sinuses through an opening about the hips.

In a series of post-operative suppurative sinuses after nephrectomies, the sinuses have invariably healed after they have existed for many years.

The five cases of fæcal fistulæ, reported in detail, are of unusual types. In one case the entire digestive contents having escaped from a laparotomy wound for months, without any surgical interference and by purely the bismuth treatment, the fæcal fistula closed with unusual rapidity and the patient increased in weight from 90 to 180 lbs. within one year. In none of the fæcal fistula cases did the author resort to any surgical treatment, and only one case out of the series of seventeen could not be cured by this method, this being a fistula of the small intestine.

The author lays special stress on the technique which he has observed to be faulty and responsible in many cases of failure which have come under his observation and from other sources.

Bismuth poisoning has not occurred in any of his cases and he believes it can be prevented in every instance.



# SURGERY OF THE EYE AND EAR

## EYE

**Wilmer, W. H.:** Three Years' Experience in Sclerocorneal Trephining in Glaucoma. *Arch. Ophth.*, 1916, xlv, 333.

Case histories of patients on whom sclerocorneal trephining for glaucoma was done are presented, the author stating that by reason of the small number he has been able to carefully follow up the cases.

His results have been very favorable, tension being lowered and pain relieved in nine eyes after the La Grange operation or iridectomy had failed and miotics had been used in many cases over periods of years.

He protests against the present unfavorable attitude toward the operation; he believes that the pendulum is swinging too far to the opposite from the procedure's enthusiastic reception, and states that in his opinion sclerocorneal trephining is the easiest, safest, and most effective method yet suggested for permanently reducing excessive tension.

Late infections, he believes, can be lessened by taking care to dissect up all the subconjunctival tissue with the conjunctiva in order to make the flaps as thick and protective as possible.

Synechiæ, lenticular opacities, hæmorrhages, and relapses are said to be no more frequently met with after this than after other methods of operating, and it has the advantages that both eyes can be operated upon at the same time; the patient does not have to be long confined; it does not reduce the visual fields or cause astigmatism to an accountable extent; there is only a negligible risk of the loss of vitreous and no danger of the escape of the lens, and the operation may be repeated. S. S. Howe.

## EAR

**Moure, E. I.:** A New Method of Examining the Vestibular Labyrinth (Sur un nouveau mode d'examen du labyrinthe vestibulaire). *Bull. de Acad. de méd., Par.*, 1916, lxxv, 413.

For some years past Moure has made it a practice in examining the vestibular labyrinth to submit the patient to a series of experiments in which provoked nystagmus occupies an important place. According to the duration and intensity of the nystagmus and the time it takes to appear, he deduces that the labyrinth is normally hyper- or hypo-excitable.

The number of labyrinthine affections occurring during the war has afforded many opportunities for putting this method into use. W. A. BRENNAN.

**Hays, H.:** The Corroborative Diagnosis of Mastoiditis by Means of the X-Ray. *N. Y. M. J.*, 1916, cii, 1163.

The author cites cases to show the value of the roentgenogram in corroborating the clinical evidences of mastoid disease. He does not insist upon the necessity of having an X-ray taken before a diagnosis of mastoiditis can be made, but he does consider it of more value than a consultation, particularly in atypical cases or when weighing the evidence for and against operative interference. Besides this knowledge, a roentgenogram shows the position of the sinus, the size and shape of the mastoid, and the extent of zygomatic cells. Otto M. Rott.

**Lent, E. J.:** Chronic Suppurative Mastoiditis Accompanied by Intracranial Pressure. *J. Indiana St. M. Ass.*, 1916, ix, 290.

A case is cited in which operation disclosed the presence of a large cyst, apparently not dependent upon the middle ear infection, as the fluid in the cyst was sterile. The patient ultimately recovered after symptoms of meningeal irritation had supervened. The cyst was drained and later allowed to become infected after which the discharge was gradually lessened in amount and finally ceased.

The author briefly discusses the question of cerebral cysts, dividing them into four classes: (1) parasitic, (2) traumatic, (3) apoplectic, (4) and degenerated neoplasms.

1. Parasitic cysts are due either to the cysticercus or echinococci.

2. Traumatic cysts are not very clearly defined in origin. They may be explained on the ground of long-continued circulatory disturbances with consequent local accumulations of serum, or shrinking of cerebral tissues in the region of injury, the result of sclerotic changes in the cerebral substances, the contraction leading to the formation of a vacuum which becomes filled with fluid derived from the surrounding membranes.

3. In apoplectic cysts the blood-clot contracts and changes from a red to a brownish color, due to the transformation of the hæmoglobin into hæmatoidin. The pigment is diffused in the neighboring tissues, giving a yellowish tinge; the detritus is transformed and absorbed so that a cavity remains containing fluid, the so-called apoplectic cyst.

4. In degenerated neoplasms cysts may be found on microscopic examination to be the end-result of an almost complete degeneration of a glioma.

Otto M. Rott.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Kyle, J. J.: Bacteriology of Nasal Sinus Disease.**  
*Calif. St. J. Med.*, 1916, xiv, 238.

With the advent of serum therapy, the author says that greater attention to the bacteriological side of nasal diseases becomes necessary. It is possible that the era of vaccine therapy is here, and here to stay, and in consequence, the microscope becomes necessary in the diagnosis of all sinus affections. It is the presumption that all normal sinuses are free from bacteria. However, in the nose there is usually to be found bacteria limited to one or more varieties. True, pathogenic bacteria are more numerous in acute suppuration and mildly pathogenic in chronic conditions. Chronic cases become active and infection virulent by new infection or by a local tissue reaction, and it is possible that so-called epidemics of grippe or influenza are in a great majority of cases acute exacerbations of old sinus diseases.

The author's dealings with laboratory men in the treatment of sinus diseases have been unsatisfactory. Very few bacteriologists are able to take pus from the sinus of the nose. Pus from the ethmoid frontal region may be secured by suction or by a platinum loop; from the antrum of Highmore, by suction through a cannula introduced into the antrum. Sometimes the author depends upon autogenous vaccines and sometimes upon stock. He desires first to know the character of the infection. The author believes that the so-called coccobacillus of Perez is more often present in the nose than heretofore anticipated, and that the organism is closely associated with, if not the cause of atrophic rhinitis. His results with vaccine treatment in ozæna have been unsatisfactory, but not conclusive. In 50 cases of acute infection of the maxillary sinuses treated during the past winter and classed among the epidemic of grippe cases, the author found in 20 cases the staphylococcus albus or citreus to be the sole organism. In one case there were bacilli pyocaneus and pneumococci mixed. In one case the bacillus pyocaneus in pure culture was present. In one case there was found the micrococcus catarrhalis. In only one case did he find the streptococcus. In one case there were bacilli prodigiosus mixed with staphylococci. In 32 ethmoid suppurations he found the bacillus coli and Friedlander mixed in 2 cases, staphylococcus 11 times, streptococcus pyogenes 2 times, pneumococcus 1 time, pneumococcus tetragenous 1 time, bacillus pyocaneus 8 times, micrococcus catarrhalis 2 times, bacillus prodigiosus 1 time, lactis areogenes 1 time.

From the author's statistics he finds that the two

organisms most active in ethmoidal and frontal suppuration during the past season were the staphylococcus and the bacillus pyocaneus.

The author had one death from meningitis following the staphylococcus albus infection of the right frontal. There was no dehiscence of the inner plate. He also had one death from ethmoidal suppuration, streptococcal in character, which traveled via the orbital cavity, and thence to the cavernous sinuses.

## THROAT

**Decherd, H. B.: Secondary Tonsillar Hæmorrhage.**  
*South. M. J.*, 1916, ix, 547.

The author considers the treatment of hæmorrhage as preventive and curative.

Preventive measures he summarizes as a proper appreciation of the importance of the operation, performed under strict asepsis, by careful dissection and cold wire snare, on uninflamed tonsils, with careful post-operative treatment both general and local.

As curative measures he advises rest in bed, ice applied locally, morphine and horse serum injected hypodermatically, with pressure at the point of bleeding or clamping of the bleeding vessel.

ELLEN J. PATTERSON.

**MacWhinnie, A. M.: Tonsillectomy; a New Method of Tonsil Eradication.** *Internat. J. Surg.*, 1916, xxix, 191.

Tonsil eradication by fulguration is applicable to all forms of tonsils, though not feasible in children on account of the noise. The advantages are that the operation is absolutely safe, may be stopped anywhere short of a complete eradication of the tonsil, is absolutely unattended with loss of blood, and there is no interruption of the patient's vocation. The author fulgurates around the tonsil, anterior to the palatoglossus, posterior to the palatopharyngeus, and internal to the so-called capsule once a week for four weeks, though exceptionally eight applications are necessary.

ELLEN J. PATTERSON.

**Coakley, C. G.: Lung Abscess Following Tonsillectomy.** *Laryngoscope*, 1916, xxvi, 1008.

The author considers aspiration of infected blood or pieces of tonsillar tissue as probably the direct cause of pulmonary abscess following tonsillectomy.

In order to avoid this complication following tonsillectomy, he thinks that the patient should be carefully examined by a competent internist prior to operation, that the operation should be performed by a skilled operator with a trained anæsthetist and an assistant trained to prevent septic material



from escaping from the tonsil into the pharynx and to keep the pharynx free from blood during the operation.

ELLEN J. PATTERSON.

**Mayer, E.: Angioma of the Larynx.** *Med. Rec.*, 1916, lxxxix, 1084.

From a study of his own case and the forty others found in the literature, the author reaches the following conclusions:

1. Angioma of the larynx is a rare disease occurring mostly in adults and the proportion of males to females is approximately four to one.
2. It may be mistaken for cancer.
3. Endolaryngeal removal of a portion of the growth for diagnosis, or its complete removal in this manner, is fraught with danger and may have serious results.
4. Laryngofissure, removal and suturing the mucosa, are entirely safe and feasible procedures.

OTTO M. ROTT.

### MOUTH

**Mayes, W. C., and Wilson, W. and C. F.: Focal Infections; Results of Overcoming Same.** *South. M. J.*, 1916, ix, 490.

Many diseases, the etiology of which has been obscure, are due to metastasis or absorption of toxins from a primary focal infection and in order to conserve the best body economy it is essential not only to treat symptoms but to remove the primary focus or at least overcome the infection.

In diseases due to focal infection if a cure is not effected by the removal of a diseased focus or if further metastases occur, then further search must be made for another focus by exhausting every aid the laboratory, X-ray, and one's diagnostic ability afford.

If for anatomical reasons the focus cannot be removed or the infection in same controlled, often the removal of a diseased tonsil, or the draining of an apical dental abscess or accessory nasal sinuses will allow the body economy so to recuperate that a cure will be effected in the original offending focus.

ELLEN J. PATTERSON.

**Horsley, J. S.: Cancer of the Mouth and Tongue with Special Reference to Metastases in the Neck.** *South. M. J.*, 1916, ix, 512.

An account is given of eight cases of carcinoma of the mouth and tongue, illustrated by post-operative and micrographical results of the pathological sections.

The author lays stress on the harmfulness of the procedure of excising a specimen of the growth and allowing some time to elapse before operation is done. In case pathological examination is necessary for the diagnosis, he advises that the excision of the specimen be done with the cautery, and the complete operation follow immediately.

In the three cases which are alive and living from one to four years after operation, there was no primary incision for diagnosis made. The five who are dead all had incisions made into the tumor mass to confirm the diagnosis.

The results of operations for carcinomata of the floor of the mouth are discouraging unless a wide dissection is made including in the block a part of the jaw bone. The author has found that the slow cautery is the best method of dealing with massive recurrences.

HARRY G. SLOAN.

**Hofmann, E.: Melanosarcoma of the Buccal Mucosa** (Melansarkom der Mundschleimhaut). *Muenchen med. Wchnschr.*, 1916, lxiii, 322.

The case reported by Hofmann was in a man of 58 who in January, 1911, presented himself with a tumor which had first appeared about a year previous. This was situated in the external part of the ascending branch of the maxillary, about the size of a cherry, hard, dark-colored and with linear radiating furrows. The tumor with the proximate tissue was extirpated under local anæsthesia by the galvanocautery. In the following week the dark lines which traversed the velum were cauterized and an energetic salvarsan treatment instituted. Two months after the first operation a dark discolored spot showed in one of the extremes of the cicatrix, which had resulted after the operation.

The tissue in which this spot was situated was circumscribed by the thermocautery and removed, radiotherapy treatment being instituted later. Histologic examination showed that this tissue as well as the original tumor which was removed was typical melanosarcoma.

The patient was lost sight of until 1915. For about a year the patient lost weight rapidly, losing 4.5 kilos in weight in little more than a month. Blackish streaks were ejected in the expectoration and microscopic examination of these showed melanic nuclei identical with the primary tumor.

In the lobule of the left lung there were catarrhal manifestations which suggested the existence of metastases. The patient was again put under salvarsan treatment.

W. A. BRENNAN.

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## SURGERY OF THE NOSE, THROAT, AND MOUTH

### Nose

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# INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1916

## ABSTRACTS OF CURRENT LITERATURE

### GENERAL SURGERY

#### SURGICAL TECHNIQUE

##### OPERATIVE SURGERY AND TECHNIQUE

Keefe, J. W.: Sheet Rubber Superior to Gauze Sponges in Abdominal Operations. *J. Am. M. Ass.*, 1916, lxxvii, 567.

The methods used by the author to avoid the accident of leaving a sponge or instrument in the tissues are as follows: counting the sponges before and after the operation, by one, two, or even three individuals; attaching tapes to the gauze pads and a clamp bead or metal disk to the tape, using large pads or strips of gauze, and as few as possible; tying together gauze drains, when several are used; the use of four or five long gauze strips, kept in bags, which are attached to the laparotomy sheet near the wound.

The only sure way to prevent sponges being left in the abdominal cavity during an operation is not to place the sponge wholly within the abdominal cavity. Numerous are the suits that have been brought, and in some cases verdicts for heavy damages have been rendered the complainant. In not a few instances a reputation built up by years of hard work is practically ruined by the mishap of leaving a sponge in the tissues.

During the last ten years the author has been using a roll of sheet rubber, which has proved satisfactory in every way. This rubber roll is about the thickness that is used for rubber bandages. It is about 8 inches wide and 18 feet long. When the abdominal cavity is opened, folds of this rubber are tucked in the wound, walling off the intestine from the site of the operative field. A part of the rubber roll lies outside the abdominal cavity, the entire roll never being placed wholly within the abdomen.

The edges of the wound may be covered by part of the rubber roll, thus protecting them from infection and trauma from the use of retractors.

It is of equal service whether operating in the pelvis, on the uterus, tubes, or ovaries, or whether excising a gall-bladder or doing a gastro-enterostomy.

The work of Henderson and other observers has shown that rubber is less irritating to the intestine than gauze. The use of the rubber roll to protect the intestine undoubtedly lessens the shock attending the operation and causes fewer adhesions following an operation.

The ease of sterilization of the rubber roll is important. This roll can be as readily sterilized as rubber gloves, and the same roll can be used many times. After an operation the rubber is washed and, while unrolled, it is boiled for twenty minutes. It is then dried, powdered, and rolled up. Previous to operating it is again unrolled and again sterilized by boiling for twenty minutes. It is then rolled and placed in a hot saline solution.

A towel is folded so as to make a pocket, into which the roll of rubber is placed and the pocket is then clamped to the sterile operating sheet near the wound. During the operation, much or little of this rubber roll can be unwound, walling off the intestine and thus protecting the operative field.

Gauze sponges, 18 inches long and 3 inches wide, made of several thicknesses of gauze, are used to wipe dry the field of operation. These sponges, however, are never placed in the abdominal cavity; instead gauze amputation rolls, 6 feet by 4 inches, are used.

EDWARD L. CORNELL.

Burnham, A. C.: The Routine Treatment of Operative Acidosis. *Am. Med.*, 1916, xi, 438.

Acidosis should be considered a resultant of disease rather than a definite pathological entity. Before, during, and after an operation certain fac-

tors are at work which favor an increased production of acid bodies. Among these may be mentioned: nervous and muscle activity, starvation, diminished oxidation of injured tissue. Starvation diminishes glycogen in the circulation; this diminution requires that muscular activity be supplied by energy from proteid or fat metabolism. In the absence of carbohydrate this type of metabolism results in the overproduction of acid bodies.

The routine treatment of acidosis suggested here is modeled after that used by Bainbridge. The symptoms which lead to a suspicion of the existence of acidosis are dyspnoea, tachycardia, and acetone on the breath. If acetone or diacetic acid are found in the urine active treatment is indicated.

As pre-operative treatment, the patient is given a purgative and several ounces of milk sugar for several days prior to the operation. Bicarbonate of soda is given both by mouth and rectum until the urine is only fairly acid. In serious cases colonic irrigations of soda bicarbonate, 6 to 10 quarts (1 drachm to the pint), are given daily. Sedatives are given prior to the operation. During long operations hypodermoclysis of saline is given. For short operations proctoclysis is given.

After the operation glucose proctoclysis is used, soda bicarbonate being added to the drip if there is a large quantity of acetone in the urine. Morphine is used to relieve the pain.

ISIDORE COHN.

**Stauffer, W. H.: The Post-operative Treatment in Rectal Surgery.** *Tr. Am. Proctol. Soc.*, Detroit, 1916, June.

The author bases this paper upon a review of over 25,000 rectal cases treated, of which 1,500 were operative. Of these cases 400 had been operated upon previously by approved methods by other surgeons.

There are two reasons for these 400 secondary operations, e.g., failure to select the operation indicated by the pathology, and improper post-operative attention.

In selecting an operation or treatment the following factors must be considered: (1) complete restoration of function, (2) time required for cure, (3) pain produced.

Unsatisfactory results — complete or partial incontinence — often are caused by needless traumatism. He does not believe in divulsion. Division of nerves causes sensory disturbances.

Incontinence may be due to fistula operation. Stauffer believes that where the fistula opens more than two inches above the sphincter the two-stage operation is indicated.

In dealing with malignancy he mentions the operation of Evans as producing the least mutilation and disturbance of function in selected cases.

Operations should be performed only after a definite diagnosis has been made.

It is insisted that the best results are obtained by proper diagnosis, careful preparation, appropriate operation, and careful after-treatment. The sur-

geon should always make the first dressing and should inspect the operative field daily. The patient should be kept under observation until recovery is assured.

## ANÆSTHETICS

**Baldwin, J. F.: Nitrous Oxide-Oxygen, the Most Dangerous Anæsthetic.** *Med. Rec.*, 1916, xc, 177.

Ether may be considered the standard of safety in anæsthesia the world over, and comparing nitrous oxide-oxygen with it the author shows that the latter is the most dangerous anæsthetic used. In the city of Columbus thirteen deaths have occurred in twelve or thirteen hundred administrations of this anæsthetic for major operations, in none of which was the death in any way attributed to asphyxia, but occurred without warning in the midst of an apparently smooth anæsthesia and with startling suddenness, despite the statement of nearly all writers on the subject that death occurs only from asphyxia.

Inquiry revealed several deaths in the practice of various anæsthetists; one in 200 administrations in a New York hospital; seven or eight in one Detroit hospital; three fatalities reported by Gwathmey in 2,500 cases; a collected series of eighteen deaths and another of thirteen, several of which had been suppressed. In several large clinics the use of nitrous oxide-oxygen has proved unsatisfactory and has been discontinued. The conclusion is reached that nitrous oxide-oxygen anæsthesia has a very limited field of action, being available for brief operations such as the extraction of teeth, and is most suitable in cases of acute pulmonary congestion or in acute nephritis. With these exceptions it is most dangerous, even in the hands of the experienced.

E. K. ARMSTRONG.

**Jones, E. O.: Nerve-Blocking as a Practical Method of Anæsthesia for Abdominal Operations.** *Northwest Med.*, 1916, xv, 223.

Everyone recognizes that in certain cases general anæsthesia is fraught with considerable danger. Numerous substitutes have been devised from time to time, some of which are attended with increased rather than lessened danger, and others have developed but a limited field of usefulness. The idea of blocking the thoracic and lumbar nerves at their points of exit from the vertebral column, first suggested by Sellheim in 1906 and improved by Kappis in 1911, is a distinct advance.

The author describes the anatomy of the spinal nerves and the innervation of the abdominal viscera, and concludes that a technique which will block both the spinal nerves and the *rami communicantes* to the corresponding sympathetic ganglia will anæsthetize both the viscera and the parietes in the area supplied.

The technique which the author employs is described in detail. Ten cases are reported in which the method has been used for abdominal operations.



In nine the anaesthesia was entirely satisfactory, in one only partially so.

The author's conclusions are that the method is not a universal substitute for general anaesthesia.

When general anaesthesia is contra-indicated for any reason this method can be used with satisfaction in the majority of cases.

It is always perfectly safe so long as the strength of the novocaine solution does not exceed one per cent.

#### SURGICAL INSTRUMENTS AND APPARATUS

Henderson, Y.: Resuscitation Apparatus. *J. Am. M. Ass.*, 1916, lxvii, 1.

In considering the devices for resuscitation there has been a general failure to distinguish between a method for maintaining pulmonary ventilation and methods (as yet undiscovered) for restoring the heart-beat and counteracting the paralyzing effects of asphyxia on the brain and cord. Of the several devices on the market the first to attract attention was the pulmotor, which has, of its own accord, aroused unfounded expectations. Supposed to supply the patient with air greatly oxygen enriched, analysis showed the oxygen content to be only 28 or 30 per cent. Furthermore the positive and negative pressures were induced in such rapid succession that the lungs were not properly distended and inflated, while the automatic reducing valve or injector was liable to get out of order, rendering the apparatus ineffective.

The "lungmotor" consists of two pumps so arranged that the down stroke forces air into a mask held over the patient's face, while the up stroke withdraws air from the patient's lungs. The "vivator" consists of one pump which forces air into the face mask. The "pulmotor Model B" is practically a pulmotor without the automatic feature. While the mechanism is rather delicate, this instrument might prove useful.

Owing to the popular overestimation of what apparatus can accomplish, the immediate application of artificial respiration is neglected and lives thereby lost. There can be no doubt that in those in whom the heart is still beating, life can be maintained much longer by means of apparatus

than by manual methods. The Resuscitation Commission found that when there was no spontaneous activity of the respiratory center, the amount of ventilation obtained by the prone pressure method was markedly reduced, and that as the muscles of the body lose their tonus and become flaccid, but a negligible movement of air in and out of the chest results.

The Commission concluded that after the cessation of respiration from drowning, electric shock, excess of anaesthesia, gas poisoning, or any other form of asphyxia, ten minutes is probably the extreme limit of time beyond which restoration is practically impossible. If the apparatus arrives after the tenth minute the individual is dead and even in those cases where it is applied within six or eight minutes the chances of resuscitation are not nearly so good as when the prone pressure method was begun within thirty seconds after the accident. Thus it would seem that breathing apparatus should be provided in those fields of work in which it can be at hand when an accident occurs, but not for cases in which it must be sent for. At bathing beaches, in a city fire department, in any hospital, and in every maternity ward suitable apparatus could advantageously be kept, but unless employees of gas, electric light, and telephone companies have been drilled in manual methods and warned not to wait for apparatus, it is not probable that the latter will appreciably decrease the number of fatalities outside of the central works.

The following conclusions are reached: (1) Universal training in the prone pressure manual will accomplish more than any amount of apparatus. (2) Artificial respiration with apparatus is superior to the manual method, in that apparatus is capable of giving a normal volume of pulmonary ventilation while the manual method is not. (3) Immediate application of a poor method is superior to the use of a perfect method after a delay of even five minutes. (4) Apparatus should be provided only where it may be immediately available. (5) Oxygen inhalation should be used in gas and smoke cases, the apparatus employed being such as will allow the oxygen to reach the lungs in efficient concentration.

E. K. ARMSTRONG.

## SURGERY OF THE HEAD AND NECK

### HEAD

Beckman, E. H.: Observations on the Diagnosis and Treatment of Trifacial Neuralgia. *Ann. Surg.*, Phila., 1916, lxiv, 242.

Trifacial neuralgia is a distinct entity which should not be confused with sinus disease or other lesions about the face in which there is pain. The pain is very often started by the slightest irritation to a certain localized area of the face or tongue,

but the pain is not continuous, nor is it a throbbing pain. Most of the patients are no more neurotic than the average person. Males and females are affected in about the same proportion. Examination of six ganglia from trifacial neuralgia cases by Wilson showed marked inflammation in all. Arteriosclerosis does not seem to play any rôle. Most of the patients are in good health otherwise.

The treatment of trifacial neuralgia is essentially surgical. Medical treatment is confined to hygienic



measures and seems to have very slight influence in the majority of cases. The author reports the results of excision or evulsion of the peripheral nerve-branches in 19 cases. The longest period of relief in any of the series was two years, and the average time of relief was 8.4 months. In the author's clinic, 146 patients have been treated by injecting alcohol into the main nerve-branches at the base of the skull. The length of time the patients remained relieved varied greatly, relief in one instance enduring as long as five and one-half years, though the average time in a series of 120 patients from whom the author heard, was 9.4 months. More recently the injection of alcohol into the gasserian ganglion has been proposed, but this method has not been tried by the author, who is of the opinion that if it is generally adopted many serious complications will ensue. He reports 18 cases which have had operations upon the gasserian ganglion. Of these patients 13 had had some peripheral operation, and all of them had had injections of osmic acid or alcohol. There were two operative deaths in this series, one shortly after the operation and the other on the twenty-first day from hæmorrhage. Of the 16 living patients, 13 have been completely relieved of their pain, or the recurrences have been so slight that they consider the condition satisfactory. There were 3 recurrences due, the author believes, to the imperfect technique of the earlier operations. As patients do not recover spontaneously, and the results of peripheral operations and injections are so temporary, the evulsing of the posterior nerve-root or entire removal of the ganglion is the operation of choice for a person in reasonably good physical condition who wishes to obtain some assurance of permanent relief.

GATEWOOD.

**Latarjet, A.: Pathologic Anatomy of the Immediate Lesions in Penetrating Cranial Fractures Due to Projectiles** (*Anatomie pathologique des lésions immédiates dans les fractures pénétrantes du crâne, par projectiles de guerre*). *Lyon chir.*, 1916, xiii, 213.

The pathological studies which Latarjet made immediately after death in cases of extensive cranial fractures have led him to the conclusion that in the less extensive injuries which are susceptible of recovery it is necessary to intervene very amply and without restriction.

The details of several cases are given with photographic illustrations to show the mechanism and consequences of various types of penetrating fractures. The large experience gained from the study and results of treatment of such injuries has led Latarjet to adopt the following treatment in cases of severe penetrating cranial fractures.

1. Very wide trepanation, which is not limited by the extent of lesions of the dura mater, but by the extent of the destructive cerebral lesions, that is to say, which extends 2 or 3 mm. beyond the limit of lesions of the soft meninges.

2. Clearance of the cerebral injured area; removal

of visible fragments; delicate cerebral exploration with light tamponade of the lesion by a tampon saturated with weak iodide tincture. This tampon is allowed to remain.

3. Insertion of a very fine meshwork saturated with iodide tincture between the endocranium and dura. When a fissure exists this mesh is extended as much as possible in order to establish a barrier between the dura and the fissured internal table.

4. Between the dura and the external cerebral face a similar mesh is insinuated. This meshwork excludes the cerebral area which is the center of it and fulfills a double purpose. It allows drainage of subarachnoidal hæmorrhage and is an obstacle to diffusion from the septic cerebral area into the subarachnoidal spaces largely open to contact as well as tending to the production of adhesences which also afford protection against the spread of infection. The meshes are resaturated with iodide by means of a tampon, and are allowed to remain in place until the fifth or sixth day when they are removed and replaced by others.

Since the adoption of this method of treatment there have been no deaths from primitive meningitis which previously had habitually caused the death of such patients in the course of the second week. Latarjet thinks, moreover, that the fear of a later reproduction of encephalitis is diminished by the isolation of the cerebral substance from the fracture and fissures. His procedure is the application to the brain of the general rule of war surgery: to clear widely, to convert the lesion into a surface wound, and to isolate the septic area.

He reiterates that clinical and anatomical results have convinced him that the extent of the trepanation must be governed by the extent of the cerebral lesion area and that an attempt must be made to exclude this area by isolating it from the osseous lesions and from its communication with the meningeal spaces and blood-vessels.

W. A. BRENNAN.

**Sencert, L.: Cranial Wounds by War Projectiles at the Front, 234 Operations** (*Sur les plaies du crâne par projectiles de guerre, à l'avant, d'après 234 opérations*). *Lyon chir.*, 1916, xiii, 283.

Sencert's report is based on 234 operations for cranial injuries carried out in the ambulance service during the first twenty months of the war. Of the 234, 92 were penetrating wounds of the skull and brain; 25 were bullet wounds; the others were shrapnel, shell, and other injuries. The 25 bullet wounds gave 4 recoveries, 21 deaths. In only 2 cases were the bullets removed and these two cases recovered. Of the 67 shell and other cranial wounds 19 were found with underlying cerebral contusion and issue of cerebral substance, the projectile generally not having penetrated into the brain. Of this group, 20 died and 17 recovered. Among 48 cases of penetrating wounds of the skull and brain with intracerebral inclusion of small projectiles, there were 29 recoveries and 19 deaths.



Rifle bullets, owing to their velocity, flattening, and ricocheting, cause death rapidly by the destruction of vast areas of cerebral substance. On the contrary penetrating wounds due to small pieces of shell, cause pia or cerebral hæmorrhages which are rapidly fatal. The cranial wound is very small, but the brain becomes distended with blood.

Post-operative death is generally due to acute meningo-encephalitis. It usually develops on the second or third day, but may be delayed to the twentieth. It is manifested by the appearance of absolutely characteristic general and local symptoms. The general symptoms are either ataxic or adynamic. In the ataxic form the patient who has been calm and motionless up to the third or fourth day develops an agitation which becomes more and more marked. A vulture-like facial expression is shown. In the adynamic form the patient who has previously been gay and of good appearance, becomes sad and morose, then somnolent and comatose, and no longer replies to questions. The face has a gray, lead-colored tint.

The most characteristic local symptom of the onset of meningo-encephalitis is the ammoniacal reaction of the cephalorachidian fluid. Once established the encephalitis progresses to a fatal issue. The author has seen no recoveries.

If the patient escapes from acute infection and from meningo-encephalitis, there is yet danger of the development of a cerebral abscess. This may occur early or it may occur a very long time after injury. When such is discovered, the tumefaction must be punctured or opened with the bistoury and evacuated, after which it usually heals rapidly.

Of the 234 cases operated upon, 103 were multiple cranial wounds. Of these, 48 were tangential, giving 28 recoveries and 20 deaths; 42 were seton wounds or oblique perforations with more or less distant irradiations; of these 12 recovered and 30 died. Among 13 bipolar perforations there were 5 recoveries and 8 deaths.

The author has been able to trace the after history in 71 cases of recovery at least 12 months after operation. Of these, 24 are dead and 47 living. The records show that 75 per cent of the cases discharged from the hospital as cured were in good condition from 12 to 18 months afterward, and Sencert considered this result highly satisfactory.

W. A. BRENNAN.

**Cotte, G.: Treatment of Cranial Wounds at the Front** (Traitement des plaies du crane dans les formations de l'avant). *Lyon chir.*, 1916, xiii, 358.

Cotte gives two series of observations, the first consisting of 17 operations for cranial injuries in a position ambulance, the second comprising 35 cases in a hospital within the fighting zone.

Cotte systematically made a direct exploration of every scalp wound observed by him and whenever there was time he made a previous lumbar puncture. Even when the liquid is clear the possibility of a fracture cannot be eliminated and it would be an

error not to make a direct examination of the wound; but if the liquid is stained then there is either a fracture or a cerebral contusion and such must be sought in the course of the intervention.

The ambulance cases gave an operative mortality of 58 per cent. In 13 out of these 17 cases where the lesion was extensive there were barely three successes at the end of six weeks. Recovery in these cases can therefore be scarcely spoken of after so short an interval.

In the hospital cases there was a global mortality of 17 per cent. Of the cases in which the meninges were exposed the mortality was 50 per cent, but of 25 cases in which the dura mater was intact, 24 recovered without incident. The one death occurred in a patient who showed a small area of cerebral contusion which was not opened. He died on the fifteenth day with signs of secondary meningitis.

W. A. BRENNAN.

**Delore, X., and Arnaud, L.: The Treatment of Cranial Wounds by War Projectiles** (Le traitement des blessures du crane par projectiles de guerre). *Lyon chir.*, 1916, xiii, 328.

Since the beginning of the war, the authors have had occasion to treat in their ambulances 122 injuries of the cranium either by bullets or shells. The global mortality has been about 36 per cent. The cases included 9 cases of rupture of the internal table of the skull with 9 recoveries; 54 cases of fissure with integrity of the dura mater, the opening of which was not judged necessary, with 51 recoveries and three deaths; 6 cases of various cranial lesions accompanied by subdural hæmatoma and more or less cerebral contusion necessitating the immediate opening of the dura, with 6 operative recoveries, 1 death later; 44 cranial fractures accompanied by bone fragments, etc., in the brain, with opening of the dura, with 18 recoveries and 26 deaths; 7 bullet wounds from one part to another, all of which died; 6 tangential bullet wounds, some creating a regular furrow involving the dura, all of which died. Such cases as arrived in a dying state or died before intervention are excluded from the authors' report.

The experience gained enabled the authors to formulate certain definite conclusions. They think that no wound of the head should be considered as insignificant. Scalp wounds should not be explored but they must be cleansed thoroughly. An apparently insignificant injury of the osseous table requires trepanation at the injured spot. Often in such cases a rupture of the internal table will be demonstrated.

Trepanation should be done *a fortiori* in the case of the more accentuated lesions. Intervention consists in regulating the edges of the osseous injury. The surgeon should endeavor if possible to exceed the limits of the fissure as infection can develop about it. Often intervention is limited to this if the dura mater is intact. But if the dura is injured, no matter how slightly, the opening must be

enlarged because there may be underlying destructive and hæmorrhagic cerebral contusion and this may be septic.

In more extensive injuries the trepanation should be larger and all foreign bodies should be removed at the first intervention if possible, if not in a second. The operation should be performed as soon as possible as the safety of the patient depends on early intervention before the appearance of infection. Late intervention should be formally rejected. Drainage is imposed in the case of deep wounds, not with gauze which favors retention, adheres to the cerebral substance, and allows the development of meningo-encephalitis, but with a small drain allowed to remain a long time in place which allows the elimination of the products arising in the contused area. Thus treated these cases often recover, provided, however, that the ventricular cavities are not involved and that osseous fissures do not irradiate too far.

Complications may arise due either to a simple meningeal irritation or to a circumscribed or diffuse suppuration (meningo-encephalitis). Whatever may be the complication the surgeon should always have recourse to two maneuvers—lumbar puncture and radiography. Lumbar puncture shows the nature of the complication and in the case of simple meningeal irritation it plays an important part. In any case it relieves the patient. Radiography allows the discovery and localization of existing foreign bodies which must of necessity be removed.

Later complications (abscess, septic necrosis of the brain with secondary hæmorrhage) occur, which may result later in the patient's death. Penetrating gunshot cranial wounds are particularly grave. Trepanation of the entry and exit orifices is imposed. The entrance trajectory which contains detached fragments will be drained, and the exit orifice, very frequently fissured, will be widely trepanned and the dura tear enlarged because there is usually a large area of cerebral contusion.

There are cases in which the cranium alone is injured while the dura is intact, but the brain does not fluctuate. Then there exists a subdural hæmatoma with more or less accentuated contusion. Besides the cerebral compression, paralysis, agitation, and coma may be noted. If, having seated the patient, no cerebral fluctuation can be discerned, it may be concluded that the cerebral lesions are intense and the dura must immediately be incised.

In patients operated upon within a few hours of injury fear of infection as well as of cerebral hernia is slight. Secondary opening of the dura is, however, not without danger. Immediate opening of the dura will not only save patients from the primary results but will even in the long run effect a recovery of the best kind.

Projectiles which strike the cranium in a natural opening (auditory conduit, orbital, etc.) may cause a fracture of the base of the skull, recalling in a measure those occurring in civil practice. In such

cases after preliminary disinfection and drainage a subtemporal trepanation or a mastoido-occipital trepanation may be necessary. W. A. BRENNAN.

**Barron, M.: Teratomata of the Brain.** *J. Cancer Research*, 1916, 1, 311.

The author discusses teratomata of the brain, reviews the literature, and reports one personal case. Teratomata have the brain for their seat of least frequent occurrence. Teratomata are growths which contain tissues that are derivatives of the three primary germ layers. A proper explanation for their growth is lacking. They cannot arise from the fertilization of polar bodies because there have been reported instances where three, four, or even five have been found in a single individual.

The case reported was that of a negro male, 19 years old, who developed headache and vomiting a day or two before his entrance into the hospital where he died shortly after. Autopsy showed that the teratomata measured 4.2 cm. x 3 cm. x 4.4 cm. and occupied the region of the pineal gland. On microscopic examination it was shown to contain gland-like structures, squamous epithelium, cartilage, columnar epithelium, bone, striated muscle, ganglion cells, etc. These tumors if they develop so as to produce symptoms generally cause death before the twentieth year. HARRY G. SLOAN.

**Leriche, R.: Pathogenesis and Treatment of Precocious, Persistent, Cerebral Hernia** (Pathogénie et traitement de la hernie cérébrale précoce persistante). *Lyon chir.*, 1916, xiii, 448.

Cerebral hernia is a frequent complication of cranial wounds. A number of small hernias which follow trepanation disappear spontaneously without leaving any trace behind. Others, greater in volume, increase incessantly and death by progressive encephalitis is the customary termination. But frequently hernias are seen to persist without increasing or diminishing in size, remaining stationary while the condition of the patient improves. If they are left untreated some may recover after a long lapse of time, but a much larger number die either from cerebral abscess or meningo-encephalitis.

This cerebral hernia is generally considered to be an indication of a deep infection and a fatal prognosis is accepted. Leriche, however, believes that this pessimistic view is the result of a false idea of the pathogenesis. In reality he says that these early persisting encephalocèles are frequently curable as they are the mechanical translation of a permanent local irritation resulting from an insufficient trepanation and therefore should be treated by an enlargement of the osseous breach until meningeal and cerebral healthy tissues are met with.

The hernia is a mechanical phenomena of tissue disorganization which is aggravated owing to the strangulation of the vessels by a very narrow bony ring; it signifies that the trepanation has not been wide enough; and that there is still a local irritating agent (fissure, superficial foreign body, etc.);



or a large area of cerebral contusion which is not decompressed. Under these circumstances a new very wide trepanation is called for; this is the best method of reducing the hernia and curing the patient. The results obtained by such methods for true persisting hernias, in the case of patients otherwise in good state, are such as to suggest that early retrepanation is called for in patients who show an increasing hernia while the general condition declines. Nearly all such patients die from progressive encephalitis, and it seems to Leriche that here again the hernia is the result of an insufficient trepanation for the lesions, although often enough this trepanation is large. Moreover, by making a very large osseous breach, perhaps the number of deaths due to infection will also be diminished.

Leriche gives details and illustrations of many types of cases; considers the mechanism of recovery of hernias after wide trepanation; and gives the technical indications for trepanation in case of cerebral fungus. W. A. BRENNAN.

**Beriel, L.: The Process of Cicatrization of Open Wounds of the Brain** (Le processus de cicatrization des plaies ouvertes du cerveau). *Lyon chir.*, 1916, xiii, 405.

Beriel's study of cicatrization of open wounds of the brain leads him to think that the following assumptions may be admitted:

1. The process of cicatrization comprises the fusion of the lips of the meningeal injury with the area of cerebral attrition and the fibrillar organization of the stump; a dura mater symphysis is also produced. These phenomena are favored by wide trepanations surpassing the limits of the area.

2. This organization of the cerebral injury and particularly the dura mater symphysis constitutes an important condition of the revivification; its later evolution appears to turn toward the absorption of the cicatrix and reconstitution of the meningeal areas and spaces. W. A. BRENNAN.

## NECK

**Maccabruni, F.: Teratoid Tumor of the Anterior Region of the Neck in a Human Fœtus at Term** (Tumore teratoide della regione anteriore del collo in un feto umano a termine). *Ann. di ostet. e ginec.*, 1916, xxxviii, 231.

The author describes the gross anatomical and microscopical details of a teratoid tumor, situated in the anterior region of the neck, in a human fœtus born at term. A search of the literature shows only a very small number of tumors of this nature situated in the neck region.

The tumor was symmetrical on both sides and of a colossal size, being much larger than the head of the child; it was heart-shaped and extended along the median line from the chin to the epigastrium measuring 12 cm., while the maximum transverse diameter was 18 cm. Below the line of attachment to the fœtal body the tumor spread in such a manner that its maximum circumference much exceeded

that of the base of the body. It occupied all the anterior part of the neck, part of its lateral portions, a part of the cheeks, and a large part of the thorax.

The tumor was invested in a capsule and covered with a fine skin; but it was only slightly attached to this skin and in places was separated from it, especially near its base, where there was a hæmatoma between the tumor, capsule, and the ligament. The surface of a section of the tumor showed a lack of uniformity in its appearance and indicated that it was made up of several distinct lobes. Such lobes were in some places constituted of compact tissue of grayish color while in others there was evidence of a sanguinary suffusion. In some places the superficies showed the occurrence of small irregularly scattered cysts varying in size. Where the tissue was compact it appeared to be finely granular. W. A. BRENNAN.

**Landivar, A. F., and Roffo, A. H.: Eberthian Strumitis** (Estrumitis Eberthiana). *Prensa méd.*, Argent., 1916, iii, 49.

A report is given of a woman of 28 years with no particular history, who entered the hospital with a round tumor, the size of a mandarin orange, in the neck situated in the lower part of the infrahyoid region and the lower internal part of the right carotid region. The tumor had appeared about a year before. Shortly after her entrance typhoid fever developed, from which she recovered, and owing to the increase in the size of the tumor and the symptoms, the tumor, which contained a large quantity of chocolate-colored pus, was removed. Cultures made from the pus showed colonies identical with Eberth's bacillus.

Eberth's bacillus may cause a thyroiditis or a strumitis, according as it locates in a healthy or altered gland. But localization in the gland is not frequent and Liebermeister and Hoffmann only found 6 such abscesses in 1,700 typhoid cases. It is usually during convalescence from typhoid that such localization occurs. When there is such Eberthian bacillus localization previous lesions of the gland lend great gravity to the invasion. Such was the case reported in which the patient sought surgical aid for the removal of a cystic lesion of about a year's standing and in whom some days after entrance typhoid appeared with evolution of a suppurated typhoid strumitis from which the Eberth bacillus was recovered in pure culture.

The evolution of Eberthian strumitis is variable. It may terminate by resolution; suppuration is not infrequent, occurring 6 times in 15 according to Liebermeister; in rare cases death may ensue due to tracheal compression. Evacuation of pus and strumectomy is the rational treatment. W. A. BRENNAN.

**Warner F.: Branchiogenic Carcinoma.** *Ann. Surg.*, Phila., 1916, lxiv, 1.

A study of the embryology of the neck gives a clear idea of the method of development of branchio-

genic fistulæ and cysts, on the one hand, and of branchiogenic carcinomata on the other. The first branchial cleft is concerned in the formation of the external ear and the eustachian tube. From the second is formed the tonsil, and from the third comes the thymus gland and the parathyroid bodies. The failure of either the second or third to close may give rise to a fistula or cyst, and from the wall of such remnants of the gill-clefts carcinomata may develop. When a cancer arises from the second cleft, it is situated just below the angle of the jaw and in front of, or just under, the sternomastoid muscle. It may require differentiation from tumors of the carotid body, from endotheliomata, and from a variety of benign tumors, such as sebaceous cysts, dermoid cysts, blood-cysts, echinococcus cysts, tuberculous glands, and even cystic goiters. Cysts in the midline, above the thyroid, are usually from the unclosed foramen cæcum from which the thyroid gland is developed. Even microscopically there may be considerable difficulty in making a diagnosis, as cell differentiation may be so imperfect that the tumors simulate endotheliomata in many parts. If

a branchiogenic tumor is glandular in type, it has been derived from embryonic inclusions of epithelium derived from the infolding of the entoderm forming the inner clefts; if squamous-celled, it is derived from either entoderm or ectoderm.

The mortality of branchiogenic carcinomata is very high. This is due in part to its location among important structures of the neck, and also to the extreme malignancy of the tumor. Operations for the relief of patients suffering from such tumor growths are always serious owing to the attachment to the deeper structures of the neck, such as the pneumogastric nerve and the carotid artery. The mortality, according to McKenty, is 100 per cent, and if there is to be any reduction in this mortality, operations must be undertaken earlier in the growth of the tumors. Any hard swelling in the region of the branchiogenic clefts should immediately arouse suspicion, especially if associated with pain as a prominent symptom.

The author reports one case with a careful histologic sectional examination of the tumor.

GATEWOOD.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Mornard, P.:** *Anatomic Study of the Lymphatics of the Breast from the Viewpoint of the Lymphatic Extension of Cancer* (Étude anatomique des lymphatiques de la mamelle au point de vue de l'extension lymphatique des cancers). *Rev. de chir.*, 1916, li, 462.

The author undertook this study of the lymphatics of the breast, at the instigation of Delbet who was struck by the frequency of the recurrence of cancer of the breast in the subclavicular cavity. The study was made in 50 dissection room subjects, the lymphatics of both breasts being injected, thus giving 100 preparations.

The result of the study of these preparations has been more interesting from the surgical than from the anatomical point of view. If the disposition of the lymphatics described in the classical texts be considered as normal then almost all the subjects deviate somewhat from this disposition and may be considered as abnormal. Of the 50 subjects injected, there were only 12 who showed the classical characteristics on both sides. These abnormal dispositions have, according to the author, great importance in the lymphatic extension of cancer.

The author divides his material into the following types:

1. The classical type.
2. Type with lymph-trunks extending to the humeral chain.
3. Type with double lymphatic pedicle.
4. Type with lymphatics between the pectorals.
5. Type with trunks direct to the subclavicular ganglions.

6. Type in which the injection has reached the internal mammary chain. W. A. BRENNAN.

**Royce, C. E.:** *Sarcoma of Scapula; Histological Diagnosis Made by Study of Blood Aspirated from Pulsating Portion of the Tumor*. *Surg., Gynec. & Obst.*, 1916, xxiii, 74.

A cytological study of blood aspirated from a pulsating tumor mass was carried out in the following way. The blood was allowed to clot and then fixed in formalin when paraffin sections were made. These showed numerous islands of tumor-cells typical of small round cell sarcoma. Before the article was published the performance was repeated with what was clinically a lymphosarcoma of the cervical region. The results were as in the first instance.

**Picqué:** *Clinical, Cytological, and Therapeutical Study of Wounds of the Chest in an Ambulance at the Front* (Étude clinique, cytologique et thérapeutique sur les blessures de poitrine, dans une ambulance de l'avant). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1903.

The studies made by Picqué are based on 45 cases of hæmothorax observed in his ambulance service at the front. Previous discussions of the treatment of chest wounds had led to conclusions favoring a vigilant expectant policy reinforced by punctures and pleurotomy to avoid the infective complications which usually mark the evolution of such wounds. As there were no precise rules as to the exact time that pleurotomy should be done, Picqué's researches were directed particularly to the elucidation



tion of this point. His procedure in the case of manifest hæmothorax has systematically been progressive evacuation by partial and repeated punctures. Every second day he withdrew from 150 to 250 ccm. of fluid until the pleura was drained, which generally occurred by the tenth day. Each puncture was followed by a strict laboratory examination of the fluid and if the surgeon found that the indications thus furnished warranted it a thoracotomy was at once performed. In such cases generally the macroscopic aspect of the fluid alone would have warranted delay. Picqué thinks that this strict co-ordination of surgical practice with laboratory results is essential in wounds of the chest and that intervention must not be deferred until pus is manifest in the pleural exudate. The appearance of pus in fluid infected by anaerobic germs is tardy and to await it is to risk the possibility of pleural septicæmia in the patient.

The general findings in the cytologic examination of pleural fluids shows that by the seventh day, in a hæmothorax evolving aseptically, there is eosinophilia. Lymphocytosis is observed in the declining period of hæmothorax. The presence and intensity of Gmelin's reaction may be considered a sign of favorable prognosis.

A hæmothorax which after the first week persistently shows a permanent and progressive neutrophile polynucleosis is to be watched carefully. In these cases infection is marked and may only become manifest after a long interval.

Blood examinations show that the early appearance of bile pigments in the serosity of the hæmothorax and a positive Gmelin reaction from the second day is an index of a good prognosis; on the other hand the persistence and intensity of hæmoglobin reaction and the absence of bile pigments is unfavorable.

Picqué insists that in watching for the signs of infection, not alone the cytological reactions but the hæmatological and clinical findings must be considered all together, especially when the pleura is invaded by an anaerobic germ of the character of bacillus perfringens.

W. A. BRENNAN.

**Robinson, S.: Thoracic Diseases; the Status of Surgical Therapy. *J. Am. M. Ass.*, 1916, lxvii, 556.**

The author laments the fact that treatment of diseases of the lungs, pleura, and mediastinum is in a chaotic state. No region of the body demands the combined efforts of the physician and the surgeon as does the pleural cavity. In cases of pneumonic abscesses, he urges early consultation, in order that we may determine when spontaneous recovery is doubtful and when operative risk begins to increase. In chronic lung abscesses, he claims less success, but sees only limited accomplishments from efforts with vaccines, climatic influences, and hygiene. Early compression therapy, in chronic abscesses, he believes does a great deal of good, and he prefers to operate to strip adhesions in cases in which artificial pneumothorax has been unsuccessful in collaps-

ing the infected lung, rather than, later, to perform a drainage operation in a thoroughly septic patient. Bronchiectasis he believes to be a chronic, incurable disease and holds little hope for successful surgical treatment of the same, nor does he believe the truth of the reports of artificial pneumothorax being curative.

Emphysema surgery offers but one operation, namely, removal of several costal cartilages on one or both sides; while this removes the distressing symptoms it does not cure. Heart and kidney complications and suppurative bronchitis are contra-indications.

Often the surgeon fails to find pus at the exact point recently located by the needle; sometimes the drainage tube is not placed in the bottom of the cavity; at other times suction is applied at the expense of drainage, or drainage is used without providing for the expansion of the lungs.

If at the end of eight weeks an operative case of acute empyema is still draining, Robinson advises against the removal of the drainage tube, injecting various pastes and solutions, or administering vaccines, till the surgeon has again been called; he may advise redrainage and freer drainage at a lower point. The advisability of opening the chest wider and freeing the lungs of its adhesions to prevent such fixation as will otherwise result in chronic empyema should also be considered. Should the empyema disorders continue for four or five months, probably decortication of the lungs or some form of osteoplastic operation to obliterate the cavity is indicated.

In the management of tuberculosis, the author believes radical and dangerous operations should be suspended until more is learned as to the actual value of collapse therapy and artificial pneumothorax. Drainage of tuberculous cavities, as a profitable surgical measure is not well regarded; the only justifiable and mechanical procedure in pulmonary tuberculosis at this time, the author believes, is collapsing the lung by the introduction of nitrogen or a fluid into the pleural cavity.

In cold abscesses, tubercular rib, and necrosis of the chest wall, drainage or excision of the abscess area alone is indicated. Free drainage or excision, plus the maintenance of the hygiene advised for tuberculosis, is the sole source of success.

Where there are other suppurations of the chest wall, Robinson suggests the following routine: (1) examination of the stereoscopic radiogram; (2) examination of the ribs with the roentgen ray; (3) study of the mediastinal shadow.

In cases of lymphosarcoma, radium and the roentgen ray are the only treatments. If myxochondrosarcoma of the ribs is present, radical removal with the involved ribs may be performed, with or without opening the underlying normal pleura, but the author emphasizes that only a total extirpation, followed by roentgen therapy during convalescence, should be employed. An exploratory thoracotomy, he believes, should be a safe procedure to be used in doubtful cases of early,

localized, malignant tumor of the lung. In obstruction of the œsophagus from carcinoma, he performs, first, early gastrostomy, then brings the œsophagus to the surface at some point above the stricture; a new œsophagus is manufactured from the greater curvature of the stomach and brought subcutaneously to the upper thoracic region in close approximation to the presenting proximal end. The two are sometimes successfully connected, either by sutures or tubing, and then, and not till then, is intrathoracic extirpation of the œsophageal cancer to be considered. EMIL C. ROBITSHEK.

**Lilienthal, H., and Ware, M. W.: Recent Progress in the Operative Treatment of Empyema of the Thorax.** *Med. Rec.*, 1916, xc, 89.

The First Surgical Service of Mt. Sinai Hospital has for the past two years endeavored to develop a line of treatment in empyema commensurate with the therapy of infectious processes in other parts of the body. This has been along two lines: (1) the relief of intrathoracic pressure immediately threatening life, and (2) the establishment of a state which would make possible a complete recovery with a minimum of complications and without deformity.

Practically all patients are X-rayed, a procedure of incalculable value. In encapsulated cases and chronic general empyema the affected side is apt to show a contracted chest rather than distention. Likewise, encapsulation is beautifully shown so that the most favorable point for drainage may be determined before operation. The differential diagnosis between residual empyema and pneumonia is often cleared and foreign bodies located.

Diagnostic puncture should only be done within a few hours of operation, and is absolutely contraindicated in lung abscess.

For anæsthesia, ether should be avoided if possible as too irritating. Local, regional nerve-blocking or nitrous oxide-oxygen is recommended.

Patients admitted cyanotic and gasping, with the heart embarrassed by dislocation, are relieved by minor thoracotomy which is merely the provision for immediate drainage without rib resection. Further operative interference is withheld until later. In 24 cases, 4 died, due to pneumonia, general severe sepsis, median suppurative otitis, and metastatic abscesses.

When healing was prolonged and the condition suitable major thoracotomy was done. This consisted of a long incision in the seventh or eighth interspace, careful incision of the pleura, separation of the ribs by the retractor, and exploration. Unless adhesions to the chest wall separate easily, they should be untouched. If inoperable pulmonary lesion is found resection of a rib with periosteum is advised to allow long-continued drainage without tubes. If the lung is bound down by tough exudate, enough of this is removed to allow of free lung expansion. Secondary abscesses are opened up and adhesions to the diaphragm are very carefully liberated.

Having mobilized the lung the wound is closed as a rule without drainage, although small anterior or posterior drains may be used. In 26 cases, 5 died, due to gangrenous pleurisy, pneumonia, and sepsis.

Emphasis is put on the fact that major thoracotomy is a secondary procedure and should not be used in desperately ill patients. It has the advantages of good exposure, slight hæmorrhage, little danger, and no subsequent deformity. Instead of mobilizing the chest wall and bringing it down to the lung, the lung is mobilized and brought out to the chest wall.

The author urges the abandonment of routine treatment and the individualization of each case.

P. M. CHASE.

**Lewin, P.: Chylothorax; Report of a Case.** *Am. J. M. Sc.*, 1916, clii, 71.

The author reports the first 50 cases of chylothorax on record. He defines it as a condition in which the pleural cavity contains chyle. This may be caused by a rupture of the thoracic duct or its radicles, or by some pathological condition of their walls, whereby the contents may be transuded into the pleural cavity.

The diagnosis depends upon four factors: (1) physical examination; (2) roentgen-ray examination demonstrating fluid in the chest; (3) history of trauma, new-growth, or liability to obstruction; (4) aspiration and examination of fluid, chemically and microscopically. The most important examination is physiological to determine whether it is true chyle.

Carlson proved that the fluid in the case reported was chyle. About 11 liters in all were removed. The glands removed from below the right costal margin and the inguinal region were found to be lymphosarcomatous.

The treatment of the condition depends upon the cause. In those cases due to chronic obstruction, aspiration, rest in bed, and nourishing foods are indicated. A word of caution as to paracentesis: Too much should not be removed at one time, because (1) of the disturbance of balance of the circulatory pressure and (2) when the pressure exerted by the fluid is released it favors the exudation of more. Cases due to chest injury are treated similarly. Where the cause is injury during operation, as for removal of carcinomatous or tuberculous lymph-nodes in the neck, the duct may be ligated, resected, or packed.

Lewin sums up the probable pathology of his case as follows:

"The patient had lymphosarcoma of the mesentery. Metastasis occurred in the inguinal, axillary, and abdominal wall lymph-glands and in the thoracic duct. The tumor growing in the duct, or metastases in the mediastinal lymph-glands caused obstruction, partial or total, of the duct with consequent transudation of chyle into the pleural cavities."



**Beck, E. G.: Bismuth Paste in Chronic Suppurative Sinuses and Empyema; Incorrect Technique as a Cause of Failure in Its Application.** *J. Am. M. Ass.*, 1916, lxvii, 21.

Beck briefly reviews the history of the use of bismuth, and points out the usual mistakes in its use. Several illustrative cases are quoted to emphasize each point.

Ten years ago the use of bismuth paste was introduced into surgery. In this length of time various surgeons report results varying from 12.5 to 100 per cent of cures. The author believes this lack of uniformity is due to faulty technique.

It must be remembered that a sinus is merely a contracted abscess cavity and such may have numerous openings with many tortuous ramifications or channels. Two cases are given illustrating this point. Further, about 20 per cent of all diagnosed cases of rectal fistulæ are in reality sinuses from spinal or hip-joint diseases. Two illustrative cases are given.

The advantages of the bismuth method are two: (1) It helps to avoid useless operations. (2) It produces results without operation. As a diagnostic aid its value is incalculable.

The technical errors usually committed that prevent success are:

1. The paste is not smooth but contains small lumps of bismuth or has water in it.
2. The mixture is not properly liquefied by heat.
3. Instruments are often improvised.
4. Undue force is used in injection.
5. The entire sinus tract is not completely filled.
6. Too frequent injections are made.
7. Sufficient time is not allowed to enable the paste to do the work.

The proper technique is:

1. Stereoroentgenograms previous to injection to detect foreign bodies or sequestra.
2. Bacteriological examinations of secretion.
3. Injection. No attempt should be made to cleanse the sinuses and an assistant should occlude all accessory openings.
4. A second set of X-ray plates to discover the original focus of infection.
5. Sterile dressing over all and rest for a few hours.
6. The dressing is changed the next day. If the discharge has changed to a thin serous one a good outcome should be expected and bacteriological examination will show an absence of infection; no further injection is necessary.
7. If the discharge continues purulent, the injections are renewed at intervals of five or six days. Further discharge—after 4 to 6 weeks—means sequestrum or inaccessibility of original focus to the paste.

Regarding poisoning by bismuth the author believes with care this may be avoided. In over 1,800 cases he has had no evidences of absorption.

Beck's conclusions are that:

1. Failures are principally due to faulty technique or carelessness.

2. The results obtained by surgeons warrant the general use of the method.

3. X-ray plates should be used to control the treatment.

4. Poisoning can be avoided and is now a rare occurrence. P. M. CHASE.

**Gaudiani, V.: The Surgical Treatment of Suppurations in the Posterior Mediastinum.** *Ann. Surg., Phila.*, 1916, lxiii, 523.

Abscesses in the posterior mediastinum must be treated by incision through the dorsal or cervical route. Nassilow in 1888 proposed the posterior route, and all abscesses in the posterior mediastinum may be successfully opened by the dorsal incision, but its real indication is for cavities located below the arch of the aorta, from the fourth to fifth dorsal down. All abscesses situated at the level or above the fourth dorsal may be successfully opened and drained through a cervical incision. Cervical mediastinotomy has a rather wide range, principally because of the fact that many abscesses have their origin from the superior part of the œsophagus or from the retropharyngeal space and only secondarily migrate to the chest. According to von Hacker, who introduced the cervical route, abscesses which originate in the superior part of the mediastinum have no tendency to spread downward, but easily migrate toward the neck. He also believes in cases of œsophageal perforation that a routine gastrotomy should be done, but Gaudiani states that this is unnecessary and that each case should be treated individually in this respect. Gaudiani does not believe that clinical experience justifies the proposal of Ziembiecki, that is, the performing of both the cervical and dorsal operation in every case.

After a review of the 8 cases reported in the literature, the author adds 2 of his own. One, a diabetic, had an incision made under local anæsthesia along the anterior border of the sternocleidomastoid, and a cavity was found which extended behind the œsophagus as far as the finger could reach. A second opening was made along the posterior border of the muscle and the patient placed in the Trendelenburg position for a few days. He entirely recovered in two months. The second case, a man who had swallowed a small fishbone one week before he was seen by the author, was treated in the same manner, but death followed in two days from acute bronchopneumonia. GATEWOOD.

## TRACHEA AND LUNGS

**Luc, H.: Contribution to the Technique of Tracheotomy in the Adult** (Contribution to the technique de la trachéotomie chez l'adulte). *Presse méd.*, 1916, p. 330.

Luc's experience in the execution of tracheotomy during the present war has given him the opportunity of simplifying this procedure and his report is made because he thinks that his simplified method reduces the accidental risks of the operation.

He makes the usual median incision; begins at the top of the superior border of the cricoid cartilage and proceeds downward for about 5 cm. The cut parts are kept well separated by an assistant. The cricoid is rapidly denuded and exposed, as well as the upper part of the trachea. When the first tracheal ring is exposed a straight tractor is applied to the lower angle of the wound and strong downward traction exercised. This results in a slipping of all the pretracheal tissue and the air passage is in consequence denuded for a length corresponding to the size of the incision. The bistoury is then applied in the tracheal wall and the rings incised from below upward. The cannula having been fixed the tractor is removed. A few sutures of the wounds, particularly above the cannula, completes the operation.

Luc's colleagues who have followed this procedure have been struck by its extreme simplicity and also by the reduction of the duration of the operation. Luc draws particular attention to certain pre-operative measures which must be carefully attended to in order that the operation may be performed with ease and success.

W. A. BRENNAN.

**Lilienthal, H.: The Therapeutics of Chronic Non-tuberculous Suppurative Bronchiectasis.** *Ann. Surg.*, Phila., 1916, lxiv, 8.

During the past few months there have been eight cases of post-operative bronchiectasis following tonsillectomies and adenoid removals under general anaesthesia in Mt. Sinai Hospital. Wessler states that 28 per cent of all lung suppurations coming to the X-ray department of that hospital followed operations of this character. The long-continued presence of any foreign body in a bronchus will almost invariably cause a bronchiectasis. Some of these cases will recover under medical treatment, but there are a number who, after all medical means have been exhausted, still have a profuse foul expectoration, periodic attacks of septic fever, and the continued fear of pulmonary hæmorrhage. This class of patients the author believes should be treated surgically.

The most important sign of this disease is the cough with easily raised, profuse, mucopurulent sputum, and complete remissions of from several hours to several days. By the aid of the X-ray, changes not demonstrable by the older methods are frequently shown, but the X-ray should be used in conjunction with the history and the bronchoscope, a most important means of diagnosis. Clubbing of the fingers may be present and vanish entirely with the cure of the disease. The general condition of the patient is dependent largely upon the amount of sepsis present. Diagnosis should be made without the aid of the diagnostic puncture which may cause injury to the blood-vessels and nerve-trunks, not to mention infections of the pleural sac.

Surgical treatment of such cases must depend upon the careful selection of cases. In the present state of surgery, bilateral chronic pulmonary in-

volvement should be considered as a contra-indication for radical operation, and, even in unilateral cases, the disease may be too far advanced to permit of radical removal. Palliative operations are almost as dangerous as extirpation, and the improvement is rarely such as to enable the patient to go about his work. The method of procedure described by the author differs somewhat from that generally adopted. While radical operation is a dangerous procedure, it is the only method which holds out any hope of cure. It has been used in seven cases by the author with four complete cures.

Preceding extirpation of a lobe, the patient should be kept in the position which will cause partial or complete emptying of the cavity. About one hour before the operation a dose of atropine and morphine is given, and before administering the anaesthetic, the thighs close to the body are compressed with ligatures to prevent venous return. Ether has been used sparingly, and in most cases nitrous oxide and oxygen have been used. Although the first to employ intratracheal anaesthesia, the author now believes that intrapharyngeal insufflation is better and safer.

For operation, the patient is placed in the lateral or lateral-prone position with the healthy side down. The incision for the resection of the middle or lower lobe should be made in the seventh or eighth interspace, beginning at the angle of the ribs and running forward to the anterior axillary line or even farther. The muscles having been divided down to the endothoracic fascia, the ribs are separated with blunt retractors, and the pleura incised with great care to avoid the wounding of an adherent lung. The pleura is usually entered near the posterior end of the incision and the opening enlarged forward. Pressure packing with gauze being out of the question in endothoracic surgery, one must be sure that there is an easy approach to any point of possible hæmorrhage. Mobilization of the focus of infection must be managed with caution, but the lobe must be freed not only from the adhesions to the chest wall, but also from the adjacent lobe. Adhesions between the uninvolved lobes and the chest wall should not be disturbed as their presence safeguards against the collapse of the lung and against the dangerous "fluttering" of the mediastinum. After the lobe to be resected has been mobilized, the entire pedicle is clamped with a powerful crushing forceps and secured with chain ligatures of strong chromic catgut. Then, cutting away the lobe, the vessels are secured separately beyond the ligature and the bronchial stumps carbolized with no attempt to invert. If there are no adhesions of the remaining lobes of the lung, a transfixion ligature should be placed through the stump and the ends, which have been left long, tied over a safety pin fixed outside the wound. This will prevent flapping of the mediastinum. As it is impossible to obtain primary union in this type of cases, ample drainage must be provided for. Convalescence is slow and often



stormy, but all of the author's cases which were cured were entirely well in from two to four months.

GATEWOOD.

**Jackson, C.: Bronchiectasis and Bronchiectatic Symptoms Due to Foreign Bodies.** *Penn. M. J.*, 1916, xix, 807.

The repetition of bronchiectatic symptoms in the histories presented by many cases in his tube work leads the author to conclude that every case of bronchiectasis, chronic bronchitis, pulmonary tuberculosis, pulmonary abscess, or chronic cough should be radiographed regardless of the certainty of diagnosis.

Every case in which the patient mentions the possibility of having aspirated or swallowed a foreign body should be studied radiographically, even though the foreign body is not dense to the ray; and if any symptoms of bronchial irritation arise even in the face of a negative ray, bronchoscopy is indicated.

Obstruction by a foreign body gives rise to a condition of "drowned lung" which simulates bronchiectasis, differing from pulmonary abscess in that the pus is contained in otherwise nearly normal passages and may lead to true bronchiectasis if the foreign body is not removed.

ELLEN J. PATTERSON.

**Jackson, C.: Endothelioma of the Right Bronchus Removed by Peroral Bronchoscopy.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

A man of thirty-five had complained of wheezing, cough, and mucopurulent expectoration of five years' duration. For two years he had been treated for tuberculosis, though bacilli had never been found in the sputum. The diagnoses of various clinicians had been: tuberculosis, chronic right-sided bronchitis, monolateral (right) asthma. DaCosta had made a correct diagnosis of stenosis of the right bronchus. A radiograph showed a dense shadow in the lower right lobe, and in consultation diagnostic bronchoscopy was urged.

The author found and removed bronchoscopically a pedunculated tumor which had made for itself a dilatation in the right bronchus. The patient entirely recovered in two weeks, and expectoration disappeared completely at the end of four weeks. At the end of ten months the patient had gained twenty-six pounds in weight and was perfectly well. The pathologist reported the growth to be endothelioma. The author reaches the following conclusions:

1. Diagnostic bronchoscopy is indicated in cases of monolateral "asthma," bronchitis, bronchial obstruction, and in cases of tuberculosis where persistent search fails to show tubercle bacilli.

2. Peroral bronchoscopic removal of an endobronchial tumor is feasible under local anæsthesia.

3. General anæsthesia might permit the clotting of blood in the lower bronchi before expulsion, involving septic risk.

4. Peroral bronchoscopic removal may be justifi-

fiable in a malignant endobronchial growth if small, circumscribed, and not ulcerated.

5. As this is the only recorded case of apparent cure of an endothelial endobronchial tumor by peroral bronchoscopy, and only the second endoscopic removal of any form of malignant growth from a bronchus, it would be unwise to make too many or too sweeping deductions.

OTTO M. ROTT.

**Piéry: Indications for the Extraction of Intrapulmonary Projectiles** (Les indications de l'extraction des projectiles intra-pulmonaires). *Presse. méd.*, 1916, p. 274.

Piéry points out that pulmonary surgery is a growth of the past ten years, but that despite its progress surgeons generally were scarcely prepared for the recent report by Marion in which he relates the extraction of intrapulmonary projectiles from 27 wounded men by a simple operative technique and without any subsequent mishap. Nevertheless, the reports submitted by other operators are not quite so optimistic and Piéry thinks that we can scarcely yet adopt Marion's dictum that all intrapulmonary projectiles without distinction should be removed, and his aim is to find precise indications for attempting such extractions.

Basing his remarks on the observations of more than 100 cases of penetrating gunshot wounds of the chest, Piéry finds that habitually there is good tolerance of intrapulmonary projectiles. Moreover, every penetrating chest wound with or without lodgment of a projectile is characterized by the simultaneous production of a pneumonic process and a hæmothorax. The essential fact which the surgeon should note is that there is a slow resolution of this pneumonia and a slow resorption of the hæmothorax. This slow evolution is observed whether or not there is a retained projectile. Such clinical showings warn that patience and abstention should be observed until such time as a spontaneous recovery is effected.

There are, however, two complications, pulmonary abscess and persistent hæmoptysis, which appear to Piéry to clearly indicate operations. These complications are generally very rare, the first having been observed by him only twice in over 100 cases and the second not at all. If these appear or there is a syndrome of dyspnoea, tachycardia, and thoracic pain, persistent for five or six months after injury, operation should no longer be deferred. If the foreign body is voluminous or irregular in shape these conditions also indicate operation. Operation should as far as possible be deferred until after resolution of the hæmo-pleuro-pneumonic syndrome, as there is then less to fear from suppuration due to hæmothorax. The experience gained from therapeutic pneumothorax shows that there need be little fear of post-operative pneumothorax; in fact Piéry counsels surgeons to seek it systematically in order to obtain hæmostasis and also a more certain and rapid cicatrization.

W. A. BRENNAN.

**Packard, F. R.: Removal of a Fragment of a Tracheotomy Tube from the Lung, Six Years After Its Inspiration.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

An Italian, thirty-three years old, twelve years previous to the present complaint, had had typhoid fever, necessitating intubation. On removal of the intubation tube tracheotomy was performed and he has worn the tracheotomy tube ever since. The past six years he had suffered from violent attacks of coughing, accompanied by expectoration of blood and much pain in his chest. An X-ray examination revealed a foreign body lodged in the right bronchus opposite the left intercostal space. The patient was etherized and the foreign body removed by means of the Jackson bronchoscope. The symptoms cleared up but the patient refused to allow the tracheotomy wound to be closed, although it seems that this might have been done readily and his proper method of breathing restored to him.

OTTO M. ROTT.

**Duval, P.: The Late Extraction of Intrapulmonary Projectiles; Operative Technique of Lung Surgery** (De l'extraction tardive des projectiles intra-pulmonaires; technique opérative de la chirurgie du poumon). *Rev. de chir.*, 1916, li, 365.

Duval has removed 40 intrapulmonary projectiles. From the anatomopathologic standpoint he recognizes three varieties of lesions: (1) projectiles contained in an inflamed pulmonary area, either totally adherent or not to the fistulized thorax; (2) projectiles contained in a healthy lung free from all adherences with the thorax, diaphragm, or mediastinum; (3) an intermediate variety, the projectile being contained in a normal lung, but with accompanying sanguinary pleural effusion, or pleural, parietal, or other adherences.

In each of these varieties the indications and operative technique are different. In the first variety extraction of the projectile is imperative; in the other two varieties it is questionable. The author's personal view, based on experience, is that a foreign body in the lung is never perfectly tolerated and that this is an indication for its extraction. Exact localization can be effected radioscopically and extraction does not present any serious difficulties. Saissi's compass gives the approximate localization and definite localization is effected by the Hirtz method. The shortest anatomic route is then selected.

There are three methods of extraction: those of Marion, Mauclaire, and the author. Marion, to avoid pneumothorax, sutures the free lung to the parietal pleura. Mauclaire, under the X-ray, penetrates directly through the pleura and lung, after or without rib resection, and closes the pleura without suturing the pulmonary incision.

In Duval's technique he makes a wide penetration of the pleura, with total pneumothorax; then the lung is seized with the forceps, drawn outside the thorax, and exteriorized much in the same way as

a loop of intestine out of the abdomen; the projectile is palpated, the lung incised, then completely sutured, replaced in the thorax, and the walls sutured.

The author thinks that Mauclaire's technique is justifiable only in grave critical conditions. It leaves the pulmonary incision gaping in the pleura and is likely to cause infection and after-troubles. Duval thinks that French surgeons have long since shown the unreality of the fear connected with surgical pneumothorax. It does not present any particular danger when the cardiopulmonary apparatus is normal.

The author's technique is based on the innocuity of slow and progressive surgical pneumothorax. This method allows easy extraction, complete minute suturing of the lung, ligation of vessels if required, and re-integration of the lung in a free pleura. It avoids operator adherences. It is the author's habit after closure of the thorax to aspire any remaining pleural air by simple puncture.

When the lung is healthy but bound by simple pleural adherences the author practices pneumolysis, detaching the adherences by the bistoury or scissors. In other cases of adherences practice has shown that wide pleural penetration is without danger; that exteriorization of the lung can be made without causing any functional disturbance of the thoracic organs; and that the lung can be freed from adherences similarly to an intestinal loop being freed from its pathologic connections; that the lung can be incised, sutured, "peritonized," and that all these procedures in a healthy lung, may be considered as aseptic and without danger to the pleura.

This very special surgery of intrapulmonary projectiles is therefore a complete modification of pulmonary surgery in general. The lung is no longer to the surgeon the redoubtable organ that it was before this practice of war surgery.

The author describes his technique in detail.

W. A. BRENNAN.

**Denéchau: The End-Results of Pleuropulmonary Wounds by War Projectiles** (Les suites éloignées des blessures pleuro-pulmonaires par projectiles de guerre). *Presse méd.*, 1916, p. 329.

Denéchau deduces certain conclusions from a study of 50 chest injuries analyzed clinically and radioscopically at periods ranging from fifteen to twenty-four months after the injury. About 80 per cent of these cases appear to be in excellent condition, but all however show more or less physical signs which constitute a regular syndrome of end-results. The disturbances noted are more or less constant pain provoked by cough or rapid walking and located at the entry or exit orifice of the projectile; dyspnoea noted in about one-third of the cases, never very intense, but is an obstacle to active life; dry slightly painful cough is also frequently noted. In the great majority of cases there is a notable diminution in thoracic expansion as well as



notable modifications in the thoracic transparency under the radioscope.

While most of these disturbances may be ameliorated by respiratory gymnastics, there may be complications. These complications are mostly of the infectious order, particularly pleuropulmonary tuberculosis.

Infection may show as purulent pleurisy, abscess, or gangrene. Such latent infection is the real danger resulting from the retention of intrapulmonary projectiles and is an indication which authorizes the systematic removal of such projectiles.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PETITONEUM

**Symth, J.:** Abdominal Pain, Especially When Associated with Abnormal Temperature, an Indication for Caution in the Use of Purgatives. *N. Orl. M. & S. J.*, 1916, lxviii, 799.

From a consideration of four cases the author reaches the conclusion (1) that the use of purgatives in obscure abdominal conditions should be avoided and they should never be given when abdominal pain is present until such conditions as appendicitis, ileus, intussusception, and ulcers have been excluded; (2) that abdominal pain with constipation and fever is so commonly the result of appendicitis that the probability of its presence should never be overlooked and that in acute appendicitis purgation is dangerous; (3) that until a definite diagnosis is made, even nutrient enemata may be withheld for 18 to 48 hours, while all food and even water should be prohibited.

E. K. ARMSTRONG.

**Behan, R. J., and Nealon, W. A.:** Interperitoneal Adhesions. *N. Y. M. J.*, 1916, civ, 165.

The authors performed experiments with 5 per cent boric acid in wool fat to prevent adhesions. The paste was rubbed in the wound. Up to the present time none of the patients experimented on have complained of symptoms which could be traced to adhesions, though it is not long enough since the first case to determine whether the danger or the tendency to adhesive formation has been entirely obliterated. In all these cases there has been a post-operative elevation of temperature beginning within the first twenty-four hours and dropping to normal within a few days. The pulse, as a rule, does not increase in rapidity. The patient complains of but little post-operative pain. Because of the apparent ease it brings to the patient, its seemingly entire harmlessness, and its evident power to inhibit adhesive formation, it has become the author's routine to use it in all cases where there is a possibility of post-operative adhesive formation.

EDWARD L. CORNELL.

### GASTRO-INTESTINAL TRACT

**Andresen, A. F. R.:** The Fractional Methods of Examination of Gastric Contents. *Proctol. & Gastroenterol.*, 1916, x, 65.

Andresen reports his results of analyses of stomach contents in 212 cases by means of the fractional method recommended by Rehfuess.

The Rehfuess stomach-tube is highly recommended in securing the stomach contents. It has the advantages of not doubling up in the stomach, not impinging on the stomach wall, being easily introduced, and is small enough to be retained for some time without discomfort. With this tube specimens of stomach contents are removed every fifteen minutes and it has been demonstrated that information gained by this method is much more reliable than that of taking one single specimen at the end of an hour of digestion.

The test meal recommended consists of two soda crackers and six ounces of water immediately followed by the introduction of the tube, which remains *in situ* until the stomach is empty. Six to eight ccm. are removed every fifteen minutes. Care should be taken not to allow the tip of the tube to pass the pylorus. The usual technique of examination is followed, the Wolff-Junghans test being used in all anacid cases.

In the normal type, mucus appears in the first two or three specimens and in the last two or three; bile appears after one and one-half to two hours as the pylorus relaxes; no blood or lactic acid is ever present and the free acid and total acidity gradually increase during the first hour, and as gradually decrease until at the end of two and one-half hours the stomach is empty.

In achylia gastrica mucus appears abundantly in all specimens; bile often by the end of one-half hour. Blood appears in all specimens, due to the atrophic, friable condition of the mucous membrane; free acid is absent throughout, and the total acidity is very slightly increased. The Wolff-Junghans albumin index gradually rises, and the stomach is empty in two hours or less.

In cancer the above findings are observed, accompanied by the constant presence of lactic acid and lactic acid bacilli, evidences of stasis, and a rapid rise of the Wolff-Junghans index. This latter is practically pathognomonic.

In reflex disturbances bile appears late; blood is absent; and the total acidity and free acidity after a more or less rapid rise remain high with the stomach empty. This indicates a continued hypersecretion, and justifies the diagnosis of an abdominal inflammatory condition external to the stomach.

In duodenal ulcer mucus appears after two hours; bile and blood appear simultaneously after an hour

and a half, and the total acidity and free acidity increase rapidly and remain high when the stomach is empty. The appearance coincidentally of bile and blood is diagnostic of duodenal ulcer when the tip of the tube is free within the stomach.

In gastric ulcer blood is found from the first; bile appears late; and the acidity curves are exaggerations of the normal type.

In all forms of pyloric stenosis the acidity remains high and the time of emptying is greatly prolonged.

In closing Andresen points out the following:

1. The Rehfuess fractional method is sufficiently practical to replace as a routine the older method of a single specimen.

2. As a diagnostic aid in duodenal ulcer, achylia gastrica, and reflex disturbances, it is of sufficient value to warrant its use.

3. In patients unable to afford expensive procedures it may take the place of the X-ray in diagnosis.

P. M. CHASE.

**Dreesman: Spontaneous Ruptures of the Digestive Tube** (Ueber spontane Ruptures des Magendarmkanals). *Muenchen. med. Wchnschr.*, 1916, lxxiii, 322.

By spontaneous ruptures are understood those in which there is no alteration of the tissues in which they are produced nor does any external force intervene to occasion them. There is no precise limit between traumatic and spontaneous ruptures. In the literature a great number of cases of spontaneous rupture of the œsophagus are met with which in general have supervened after very heavy eating or during a vomiting paroxysm.

The majority of the subjects were drinkers and in such cases there is a certain predisposition which caused a species of autodigestion of the œsophageal wall. The symptoms of rupture of the œsophagus are acute sudden pain, vomiting, and collapse, with frequently emphysema in the left supraclavical fossa and rapid death.

Dreesman relates a case observed by him in a girl of 14 years who had previously had an amygdalotomy. After the operation there were attacks of severe bloody vomiting. On the following day the hæmorrhage continued, and on the eighth day some fever developed; the pulse diminished; and later the patient died without any recurrence of the hæmorrhage. Autopsy showed the existence of an œsophageal perforation through which a large quantity of fetid liquid consisting of blood and gastric contents had passed to the pleuritic sac. The cause of the perforation must be attributed to a diminution of the resistance of the tissues caused by the loss of blood, by autodigestion of the œsophageal wall, and to the efforts made in vomiting.

Spontaneous rupture of the intestines are frequently observed but Dreesman does not know of any spontaneous rupture of the stomach. He has seen two cases of spontaneous intestinal rupture. In one of these the rupture occurred during defeca-

tion and was followed by peritonitis, which despite a laparotomy resulted in death. In the other case, there was a rupture of the transverse colon, the patient having been injured by a wagon. The man walked home and laparotomy was not done until he was removed to the hospital in a moribund state. A study of the literature demonstrates that cases have been published in which the pains have been so slight after rupture that the patients have been able to continue at their work for a short time.

W. A. BRENNAN.

**Sullivan, R. P.: Perforated Ulcers of the Stomach and Duodenum.** *J. Am. M. Ass.*, 1916, lxxvii, 330.

Between September, 1910, and March, 1916, the author operated on 20 cases of perforated ulcer. In this series there were 15 duodenal and 5 gastric perforations. Death resulted in one case of perforated gastric ulcer. There were 6 females and 14 males. The average age was 34 years. The average duration of acute symptoms before operation was about six hours. The treatment in each case was surgical.

The chief symptoms which led to a correct diagnosis in these cases were: (1) pain, (2) tenderness, (3) vomiting, (4) rigidity, (5) history of previous ulcer symptoms, (6) anxiety and restlessness, and (7) increasing pulse and rise of temperature. This enumeration is considered in the order of frequency observed in the series reported.

In the 15 duodenal cases, multiple ulcers were noted in only one instance. The site of the perforation in 12 of these was on the anterior wall and in the first portion of the duodenum. In two instances the perforation was on the upper border and close to the pylorus. In one instance the perforation was on the posterior wall and about 1 inch from the pylorus. The operative procedure in dealing with these cases was as follows: In 10 cases the perforation was closed by two layers of sutures. The abdominal cavity was thoroughly cleansed, either by the sucking apparatus or by mopping out with gauze. This was followed by a posterior no-loop gastro-enterostomy. Recovery in each instance was most satisfactory and without any marked degree of reaction or discomfort. In 5 cases the operative procedure was a simple closure of the perforation by two rows of suture and covering with an omental graft. This was always followed by a thorough cleansing of the abdominal cavity by means of the sucking apparatus or mopping out with gauze pads. In 2 cases no drainage was used. In the convalescence of these cases it was noted that the patients suffered a great deal more pain and discomfort than those in which gastro-enterostomy was done.

The conclusions are as follows:

1. The diagnosis of perforation of a gastric or duodenal ulcer should be made in the majority of cases, and the imperative indication is early operation.

2. In the treatment of cases of duodenal or pre-



pyloric perforations, gastro-enterostomy can safely be added if patients come to operation within ten hours after the onset of symptoms.

3. Simple closure of the perforation without gastro-enterostomy is a safe routine, but later stenosis is more apt to occur.

4. Drainage can be discarded in early cases, especially if operation is performed within six hours after the onset of symptoms.

5. Early use of a liberal diet should be practiced.

6. A complete study of end-results is a necessity before any definite routine can be laid down.

EDWARD L. CORNELL.

**Knott, V. B.: Excision Versus Gastro-Enterostomy in the Treatment of Gastric Ulcer.** *Surg., Gynec. & Obst.*, 1916, xxiii, 21.

As the tissue changes attending most chronic gastric ulcers are permanent and as ample statistics proving that the larger proportion of cancers of the stomach are implanted upon an ulcer base are now available, it is urged that in every case of ulcer treated surgically, the ulcer be excised when possible. As an additional reason for the radical treatment of gastric ulcer is mentioned the fact that about one third of the cases treated by gastro-enterostomy without excision or pylorotomy require a second operation at which one of these procedures should be applied. Ulcers situated near the pylorus, upon the anterior wall of the stomach, along the lesser curvature involving both the anterior and posterior walls and upon the posterior wall, even though at times adherent, may in many but not in all instances be excised. Gastro-enterostomy must frequently accompany excision of an ulcer or ulcers but it is urged that whenever excision is possible within safe limits that it should be made and the fate of the patient not left to gastro-enterostomy alone.

**Lindsay, J. A.: The Diagnosis of Cancer of the Stomach.** *Lancet*, Lond., 1916, cxcii, 7.

The author bases his observations on 40 cases of cancer of the stomach. The points of interest in the paper are as follows:

1. There is a clear family history of cancer in 10 per cent of the cases.

2. There was a previous history of gastric ulcer in 12.5 per cent of the cases.

He comments on the discrepancy between physicians and surgeons as to the frequency with which simple gastric ulcer precedes gastric cancer and questions the higher frequency which has been mentioned by other surgeons and pathologists.

He gives the following list of symptoms as those which first attracted the patient's attention.

	No. Cases	Per cent
Painful dyspepsia.....	15	37.5
Vomiting and pyrosis.....	9	22.5
Loss of weight.....	6	15
Progressive weakness and anæmia.....	4	10
Hæmatemesis.....	3	7.5
Anorexia.....	2	5
Melena.....	1	2.5

He states that painful dyspepsia arising for the first time in a patient over 40 should lead to inquiry for gastric cancer.

It is of interest to note that in almost one-half of the author's cases the patient had a rise in temperature. In 71 per cent of the cases there was an absence of free hydrochloric acid. Tumor was present in 37.5 per cent of cases.

In the differential diagnosis he discusses chronic gastritis, non-malignant pyloric growth, pernicious anæmia, and phthisis.

As regards the increase in cancer of the stomach Lindsay states that in 1897 the deaths from cancer of the stomach were: males, 135 per 1,000,000; females, 123 per 1,000,000. In 1910 the figures were males, 185 per 1,000,000; females 155 per 1,000,000.  
D. C. BALFOUR.

**Barr, R. A.: The Advantages of Separate Suture of the Mucous Membrane in Gastric Surgery.** *Surg., Gynec. & Obst.*, 1916, xxiii, 23.

The mucous and submucous coats of the stomach make a very substantial structure, and the muscle is readily separated from them. By division of the stomach wall into two layers, one consisting of the peritoneum and muscle and the other consisting of the mucous and submucous coats, the ordinary operations of resection of the stomach and gastro-jejunosomy can be done with less exposure of the inner surface of the mucous membrane, and with a resulting suture line that is just as secure and much more flexible than that secured by the ordinary method of suturing through the entire thickness of the stomach. The permanent control of hæmorrhage can be assured as operation proceeds, since the same clamps are not used to control the blood-vessels and to keep the stomach cavity closed.

Pyloric occlusion can be made by submuscular resection of the pyloric mucosa, or the resection of mucosa can be extended as desired, gaining the advantages of unilateral exclusion or pyloric resection with an operation of much less difficult technique.

**Richards, O., and Fraser, J.: Paralysis of the Intestine After Resection for Gunshot Injuries.** *Brit. M. J.*, 1916, ii, 9.

This serious complication seems to occur only in the small intestine. It consists in the paralysis and distention of the gut immediately above the junction which is made after removal of an injured coil. The distention ends sharply at this point and the bowel below remains in a contracted and apparently healthy state. If unrelieved the condition is rapidly fatal in the same way as any other form of acute obstruction. It may occur either in cases operated on after a considerable interval, or in those which have been dealt with within a few hours.

The following conclusions are drawn:

1. Resection of a wounded coil of small intestine is sometimes followed by obstruction, the segments of intestine above the union becoming distended while the segment below remains contracted.

2. In cases operated on within a short time of the receipt of the injury, the paralysis is probably mainly due to some interference with the nervous mechanism, caused by the injury itself and the resultant shock and increased by other causes; for example, local peritonitis.

3. In cases operated on after a considerable interval a further cause is that continued obstruction and consequent septic absorption render the bowel above incapable of rapid recovery.

4. A case in which this complication has occurred may possibly be saved by a subsequent short-circuiting of the affected coil. EDWARD L. CORNELL.

**McWhorter, J. E., Stout, A. P., and Lieb, C. C.: The Process of Repair in Wounds of the Small Intestine.** *Surg., Gynec. & Obst.*, 1916, xxiii, 80.

The authors' observations deal with the process of repair in the small intestine following resection of both a normal and a gangrenous loop. The results obtained are based on the following experiments: (1) the determination of the hydrostatic pressure that a repairing intestinal wound will withstand; (2) the effect of transverse division and suture on segmentation; and (3) an observation of the gross and microscopic phenomena of repair.

The results are summed up as follows:

The non-infected suture line withstood an internal pressure of over one pound per square inch. This resistance to leakage was as marked immediately following the operation as it was at any time thereafter.

2. In the non-infected specimens the gut showed segmentation to within 5 mm., while in the gangrenous ones no segmentation occurred within 15 mm. of the suture line.

3. Repair began at once with the coagulation of the exudate that filled the space between the two approximated surfaces.

4. Fibrous union occurred in from seven to ten days.

5. The denuded surface was covered with immature mucosa in about twenty-three days, while regeneration was complete in about two months.

From the above results it was concluded that fluid and food may be given immediately after operation without danger of leakage in the sutured small intestine.

**Vilvandré, G.: Appendicitis; Its Radiodiagnosis.** *Arch. Radiol. & Electrotherap.*, 1916, xxi, 49.

In view of the frequent occurrence of fecal concretions with appendicitis, the author studied a few patients with rather indefinite abdominal symptoms roentgenographically with the hope of clearing up the diagnosis. He reports four cases in which localized areas of increased density were shown on the roentgenogram in the right iliac region which he interpreted as being connected with the appendix. Two of these cases were operated upon. In one a concretion was found associated with a gangrenous

appendix; in the other was a much thickened appendix containing some thick pus and gangrenous at its lower end. In both cases the location corresponded to the shadow revealed by the roentgen examination. The other two cases were not verified by operation.

Regarding the possibility of confusing these shadows with renal or ureteral calculi or stones in the gall-bladder or its ducts, the author believes that the location will exclude error in most cases. Appendicular shadows are usually situated more externally and lower down than the other. Inasmuch as there is no added risk in the procedure and some valuable information clearing up the diagnosis may be disclosed, the author recommends its more general use in doubtful acute abdominal conditions.

A. HARTUNG.

**Connell, F. G.: Pseudo-Appendicitis.** *J. Am. M. Ass.*, 1916, lxxvii, 335.

The question of chronic appendicitis calls for attention, not because of a high mortality rate, but because of a rather disconcerting morbidity rate, a post-operative persistence of symptoms. When a patient complains of the same symptoms after appendectomy as before the operation, there is sufficient reason for belief that the original symptoms were not caused by the appendix — that the treatment was based on an incorrect diagnosis. The large and apparently increasing number of these cases calls for close attention and an analysis of all available data in the hope of arriving at some more definite justification for making a diagnosis of "chronic appendicitis." The author records 87 cases in which the removal of the appendix for chronic appendicitis or interval operation for appendicitis had not been followed by relief of symptoms; 212 patients were operated on during this interval with such a diagnosis.

These cases of pseudo-appendicitis were usually in young thin adults from 15 to 30 years of age, more common in females, and about equally divided between married and single.

The duration of symptoms varied from "some weeks" to ten or more years. The number of "attacks" varied between one and six to "many," some recurring at regularly stated intervals.

The pain of attacks rarely puts the patient to bed, though classed as "severe" in about one-third and "mild" in one-third of the cases. The pain is frequently described as "continuous" or "side ache" and made worse by exertion. Hypersensitiveness and tenderness are usual and a "burning" sensation is frequent, but rigidity is not common.

Pain is usually located in the right iliac fossa, though it may occur anywhere on the right side or at the umbilicus.

Tenderness at the scar of a previous operation is rare.

Temperature elevation is uncommon, subnormal temperature frequent.

Nausea is usual, vomiting rare, "indigestion"



and "gas" frequent, with constipation present in two-thirds of the cases.

General abdominal ptosis is very common, iliac tumor, gas tumor, dilated cæcum and gurgling in the right iliac fossa almost constant.

Skin changes are variable and urinary symptoms occasionally present.

These patients are frequently spoken of as "neurotic" in the history and complain of "neuritis" in various parts of the body, usually on the right side. Goiter was present in a small proportion of cases.

Blood examinations showed leucocytosis absent, lymphocytosis rarely present, the Wassermann in the blood negative.

Spinal puncture in 9 of 12 cases showed increased tension. The Wassermann in the spinal fluid was negative in 12 cases.

There was lack of hydrochloric acid in the stomach contents in one-fourth of the cases examined.

Mucus in the stool is not common.

Roentgenoscopy shows ptosis and delay at the ileum or ascending colon.

Sections of the appendix show nothing characteristic. The recent report of Moschowitz is of interest in this connection.

Mesenteric glands, on section, show simple hyperplasia, and cultures from the same are negative.

At primary operation in 48 cases, the appendix was usually small and with fecal concretions in one-fourth of the cases.

There was free fluid in the peritoneal cavity in one-fifth of the cases and enlarged mesenteric lymph-glands in one-fifth of the cases.

Ptosis, cæcum mobile, Lane kink, and pericolic membrane are not uncommon.

The primary immediate result of operation is very satisfactory, but there is usually a return of symptoms within the first year.

Trauma, pulmonary tuberculosis, or "nervous shock" in some cases precede the return of symptoms.

Findings at secondary operation (in 19 cases) by the author: Adhesion of omentum or viscera to site of appendix is absent. Adhesions are uncommon; ptosis, cæcum mobile and various membranes are constantly present. Mesenteric lymph-glands are found enlarged in one-third of the cases.

The remote results of various secondary operations are not encouraging: in 27 cases, unknown 2, improved 9, unimproved 15, death 1. In 60 cases in which operation was not performed a second time, the results were: unknown 8, improved 16, unimproved 36.

Cases characterized by more or less continuous discomfort in the right side of the abdomen, or of mild attacks of short duration, with brief intervals of relief, in which the pain is made worse by exertion and with relief on recumbency, associated with hypersensitiveness of skin and spasm of muscle, gas tumor, cæcum mobile, gurgling, nausea but rarely vomiting, normal or subnormal temperature, no

increase in leucocytes, constipation, enteroptosis, and evidence of vagus irritability, leading sometimes to chronic invalidism, are often pseudo-appendicitis and are not permanently relieved by removal of the appendix. Such cases should, therefore, be given careful consideration before operative measures are instituted.

An entirely satisfactory explanation of this state of affairs has not yet been presented, though intensive study suggests that a lack of balance between the vagus and sympathetic divisions of the autonomic nervous system may be an etiologic factor.

This, in turn, may be due to abnormal function of some of the endocrine glands.

Much is to be learned regarding this clinical syndrome, but, in the meantime, accumulating experience strongly suggests the desirability of emphasizing the fact that the diagnosis of chronic appendicitis calls for more justification than is often given it.

EDWARD L. CORNELL.

**Mayo, W. J.: Anatomy, Physiology, and Pathology of the Large Intestine, with Some Observations on the Radical Operation for Colonic Tumors.**  
*J. S. Car. M. Ass.*, 1916, xii, 165.

The author gives a brief résumé of the newer accepted ideas on the anatomy, physiology, and pathology of the large intestine accompanied by a report of his experience with the radical operation for colonic tumors.

The normal intestinal movement in the colon is largely antiperistaltic so that fluids introduced into the rectum are carried backward for absorption above the splenic flexure. Band claims this is by "reverse mucus currents."

The control of the large intestine depends upon the essential rhythm of non-striated muscle which is more or less independent of the cerebrospinal nervous system. According to Keith, the so-called nodal tissue occurs in definite amounts in several gastro-intestinal situations. It is this nodal tissue that in contracting causes the different static and spastic phenomena of the tract.

Regarding the surgical procedures, free cartharsis preceding operation is unwise as the bacteria of the lower bowel are thereby rendered more active. Adam and Cushing claim the contents of the duodenum and upper jejunum are relatively sterile, this condition diminishing as the large gut is approached.

The degree and acuteness of obstruction of the large bowel closely measures the mortality of the necessary operation. Marked obstruction interferes with the vitality of the distended intestine, prevents proper asepsis, and renders anastomosis difficult. The diagnosis of beginning obstruction is based on (1) alternate constipation and diarrhœa; (2) abdominal cramps and borborygmus; and (3) on palpation, the peculiar localized stiffening of the intestinal wall on the proximal side of the stricture.

In acute obstruction, primary resection should never be done; colostomy being the procedure of choice and later, resection performed.

The best incision is that to the inner side of the seat of disease. If the diagnosis is uncertain, the first incision is in the midline, followed by one over the diseased area. If much distention is present it is best to puncture the distended intestine.

The most important technical feature is free mobilization of the tumor mass and adjacent bowel. There is no danger in dividing the outer leaf of the mesentery as this contains no important structure and in so doing, in the majority of instances, the colon is freely mobilized.

The structures to be identified in the radical operation are: (1) the duodenum which is exposed in freeing the ascending colon and hepatic flexure; (2) the ureters, which may be carried with the mesentery of the ascending and descending colon, especially at the brim of the pelvis; and (3) the vas deferens which are associated with the sigmoid and rectum.

When near by organs become involved in the tumor mass this is not a contra-indication as these may be successfully resected or removed *in toto*.

In the large intestine the author uses the end-to-end method of anastomosis and when the union is to be between the large and small bowel an end-to-side method. In the end-to-end variety it is essential that at least one of the segments be well surrounded by peritoneum as otherwise fistula may result.

If marked obstruction and distention are present the three-stage operation of Mikulicz is recommended.

If there is danger of leakage from the anastomosis Mayo recommends suspending this beneath the incision with a slight rubber drain down to the gut so as to allow free drainage to the surface.

In low sigmoid and rectosigmoid tumors the tube method of resection described by Balfour is most efficient and safe.

P. M. CHASE.

**Rowlands, R. P.: Carcinoma of the Colon Causing Intestinal Obstruction, *Guy's Hosp. Gaz.*, 1916, xxx, 207.**

The usual history of carcinoma of the colon is that of chronic obstruction terminating in acute or complete obstruction, the symptoms developing much less rapidly than those due to obstruction of the small intestine. Abdominal pain becomes much more severe, sometimes being sudden in onset and associated with collapse. Constipation usually becomes complete, although there may be several small passages consisting of mucus and blood. The abdomen becomes greatly distended, not only in front but in the flanks and loins, where there may be some dullness due to large amounts of fluid in the colon. Vomiting is often only a late and terminal symptom.

Chronic intestinal obstruction must be differentiated from gall-stones, which give rise to repeated attacks of cholecystitis accompanied by constipation; from subacute attacks of appendicitis with constipation; or from an inflammatory condi-

tion in colonic diverticula. All of these conditions are usually associated with local tenderness and rigidity, with pyrexia, in contrast to the supple, non-tender abdomen, and subnormal temperature of obstruction of the colon. In these conditions also, cathartics and enemata are effective. Strangulated hernia; tuberculous or malignant stricture of the small intestine; volvulus of the colon; and impaction of a gall-stone or a fecolith in the pelvic colon, must all be considered in the diagnosis.

In 70 per cent of cases the obstruction is below the splenic flexure, in some cases being palpable. Occasionally obstruction in the pelvic colon has given rise to caecal distention alone, so that the exact location of the trouble is not always easy. Bimanual pelvic examination is sometimes of value, as is the use of the sigmoidoscope.

From an operative standpoint these cases may be divided into two general classes, those in which resection is hopeful and those in which it is impracticable. When the growth is movable and not invading any important viscus and there is no evidence of secondary growth, resection may be considered hopeful. Three chief ways are open to the surgeon:

1. Colostomy above and away from the obstruction, preferably in the transverse or ascending colon. This operation is safer than short-circuiting in the presence of complete and late obstruction with intestinal paralysis.

2. Short-circuiting, which is particularly applicable to growths in the ileocaecal region and which does not interfere with a subsequent resection. With complete obstruction it is not so likely to save life as colostomy, otherwise it is cleaner and often renders subsequent resection easier.

3. Resection with drainage, in which method the affected coil is brought outside, the growth removed, and two Paul's tubes tied in. In case the patient's condition is too grave to permit removal of the growth, a Paul's tube may be tied in the delivered loop above the growth and the latter removed later. When there is no hope of resection, colostomy is to be avoided whenever possible and short-circuiting adopted instead. Thus relief may be given for several years.

E. K. ARMSTRONG.

**Drucek, C. J.: Diagnosis of Cancer of the Rectum. *Proctol. & Gastroenterol.*, 1916, x, 87.**

The author describes the different types of cancer of the rectum, their symptoms, and the degree of malignancy.

In the large bowel occur fully 95 per cent of the cancers of the intestinal canal, 80 per cent of which are found in the rectum. Most frequently these cancers are found three to five inches within the rectum, next in order around the anus, and lastly in the upper rectum and sigmoid.

At the anus the cancerous formation is identical to that on the lip, both histologically and clinically. The tendency is to surround the anus and perineum



rather than to invade the rectum. Hæmorrhage and pain are slight.

In the differential diagnosis, lupoid ulcers show bands of scar tissue, the ulcer edges not thickened, and the scrapings usually show tubercular bacilli; plain tubercular ulcerations appear as anal fissures which later coalesce, are not painful, and seem to be situated on a dense fibrous layer that limits their extension downward. Simple ulcers are irregular in outline, crater-like with profuse granulations and foul smelling pus. Rodent ulcers rapidly grow downward, have few granulations and only moderate induration around the base. Simple fissure gives a sharp pain at stool and is located only in the anal fold. Chancres in this region are identical with those of other parts.

Cancers within the rectum are typical adenocarcinomata. These probably arise from the cylindrical cells lining the crypts of Lieberkuehn and rapidly assume a malignant character. They are found above the sphincter, are usually ulcerated, and are of three varieties: (1) encephaloid, (2) scirrhus, and (3) melanotic, the first two predominating.

Symptomatically, cancer above the middle of the internal sphincter develops insidiously, being most often taken for hæmorrhoids in the earlier stages. A sense of fullness in the rectum after stool is among the earliest signs, followed by straining and bearing down. Soon follows a slight morning diarrhoea and when the sphincter is involved, partial incontinence. A bloody discharge of foul odor from the ulceration at the site of growth then appears. This ulceration is of two kinds: (1) that usually found in the scirrhus form, consisting of ulcerations above the mass due to impaction and absorption of fæces and their toxins; and (2) that usually found in the encephaloid type, consisting of ulceration and decay of the center of the tumor mass.

Obstruction is a variable symptom and resembles that of simple benign stricture.

As the history is often misleading, differentiation largely depends on a physical examination.

On digital examination scirrhus cancer, which is the most common form, is felt just above the internal sphincter as a hard nodular mass usually involving the rectum in a ring-like growth. Gussenbauer estimates that 65 per cent of all rectal cancers are of this variety.

The encephaloid variety presents a soft polypoid mass with a broad base infiltrating the submucous tissue, and bleeding quite easily; areas of necrosis are easily felt, and great care must be taken not to perforate the bowel wall.

In the differential diagnosis, congenital stricture is always observed before puberty, and is a long-standing condition, whereas cancer is found in adult life and is of short duration; benign fibrous stricture is often difficult to differentiate, but, in the main, is of even consistency, whereas cancer is rough and nodular. The histories are entirely different; benign papillomata are pedunculated, with no infiltration around the base but are always to be

considered malignant as the differentiation is almost impossible; chancres are very rare above the sphincter and mucus patches only occur with other evidences of syphilis; gummata show early a mucous membrane freely movable over the tumor which later ulcerates, followed by a cicatrix which may cause stricture; proliferating proctitis presents a soft granulating mass with its base limited to the mucous membrane and spreading all over the rectum.

In conclusion, Drucek adds that if the entire mass and sufficient perirectal tissue can be removed the prognosis is relatively good, but in advanced cases it is bad regardless of operation. P. M. CHASE.

**Drucek, C. J.: Pruritus Ani.** *Internat. J. Surg.*, 1916, xxix, 179.

The author considers the etiology, symptoms, and treatment of pruritus ani.

The causes of pruritus ani are many and varied. Among the most frequent are hypertrophied papillæ, fissure, cryptitis, hæmorrhoids, proctitis, prolapse, polypus, chronic prostatitis, impacted fæces, fistula, eczema marginata, and parasites. A careful search for the underlying cause in every case is absolutely necessary for successful treatment.

The predominant symptom is unbearable, painful itching, worse at night. This itching is not confined to the anus but radiates over the buttocks, across the perineum and down the legs. Scratching gives merely momentary relief, the condition becoming more pronounced and painful after. There may be periods of remission and relief.

On examination, in early cases, nothing may be seen, although local congestion is usually found. In old cases, the skin is thick, dry, pale, and eroded or fissured. Evidences of syphilis, tuberculosis, rheumatism, and diabetes should be looked for.

Unless properly treated the case may end in nervous prostration, insanity, or an opium wreck. Under careful treatment a favorable outcome may be looked for.

The treatment depends on the cause. The diet should be regulated, constipation corrected, and faults of the genito-urinary system attended to. The constitutional causes should receive appropriate attention. Clothing, especially at night, should be free and cool.

Locally, proper attention to cleanliness is essential (newspaper ink is irritating). The hypersensitiveness of the anal mucous membrane and sphincters is overcome by gradual dilatation without anæsthetic. The rectum and colon are flushed out gently each day with warm water. With local infections, the hot sitz-bath, 110°, for three-quarters of an hour followed by the application of hydrastal ointment is beneficial. Autogenous vaccines are successful occasionally.

In eczema with dry, scaly skin a solution of caustic potash, 5 grains to the ounce, is useful; with the moist forms, silver nitrate solution, 20 grains to the ounce, may be used.

Frequently tincture of iodine relieves the condition. With thread worms appropriate treatment relieves the itching.

The X-ray will sometimes be successful when other remedies have failed, although its usefulness in this condition has been overestimated.

As a final resort in some few cases that resist all forms of treatment, surgical procedures have been instituted with the idea of destroying the sensory nerve supply.

P. M. CHASE.

### LIVER, PANCREAS, AND SPLEEN

**Henes, E., Jr.:** The Value of the Determination of the Cholesterol Content of the Blood in the Diagnosis of Cholelithiasis. *Surg., Gynec. & Obst.*, 1916, xxiii, 91.

The quantitative determination of serum-cholesterol has proved of positive value in the diagnosis of cholelithiasis, and especially in the differential diagnosis of conditions whose symptoms and signs are referable to the right side of the abdomen. As with all clinical tests, cholesteræmia must be correctly interpreted to make it of value; and correct interpretation involves a knowledge of those conditions and clinical states which increase or decrease the amount of cholesterol in the blood. At the German Hospital this determination properly interpreted has been of exceeding great value and has frequently forecasted the condition found at operation in spite of the best diagnostic skill and roentgen ray technique.

**Shaw, H. A.:** Surgery of the Gall-Bladder and Biliary Passages. *Internat. J. Surg.*, 1916, xxix, 211.

The gall-bladder is developed only in those animals requiring irregular and intermittent jets of alkaline bile and protective mucus to neutralize or saponify, according to the character of food ingested.

In experimenting upon animals, the changed character of the gall-bladder bile and liver-duct bile is still more marked. Liver-duct bile has been injected into the ducts and into the substance of the pancreas, producing destructive inflammation and gangrene, while gall-bladder bile proved entirely harmless.

When the pylorus relaxes or opens to allow the acid chyme to enter the duodenum, the gall-bladder simultaneously contracts, pouring its alkaline bile and protective mucus through the ampulla of Vater into the second portion of the duodenum.

Both the vagus (motor) and the sympathetic (inhibitory) supply the muscularis of the gall-bladder, and while it is a proven fact that the acid chyme passing from the pyloric vestibule produces contraction of the gall-bladder, the exact pathway of this reflex is not thoroughly understood.

Ochsner says: "These spasmodic contractions of the gall-bladder correspond with contractions of the stomach and they will subside when the stomach is

at rest, only to occur again when the condition of rest in the stomach is interrupted."

The author urges the necessity of complete exploration of the abdomen in conditions in which an operation is performed in the right upper quadrant.

The technique of exploration is as follows: (1) The size, color, thickness, and anatomic relations of the gall-bladder are noted. Valuable information can be gained by squeezing its walls and noting their elasticity—the more elastic the less scar tissue, and consequently the less organic injury. (2) The gall-bladder, cystic, hepatic, and supraduodenal portion of the common duct are palpated, the thickness of the wall, any possible stones, cicatricial contractions, glands, etc., being noted. (3) The gall-bladder is gently squeezed and, if it does not empty freely, an effort to find the point of obstruction should be made by alternately contracting and relaxing with one hand and palpating with the other, noting the farthest point to which the impulse is conveyed.

C. G. HEYD.

**Lund, F. B.:** Cholecystostomy vs. Cholecystectomy. *Boston. M. & S. J.*, 1916, clxiv, 909.

The advantages of cholecystostomy are that it is usually a simpler operation than that of cholecystectomy, that it provides easy drainage for septic bile, and that in case of stricture of the common duct or pancreatitis it forms a comparatively safe method of relieving the condition. On the other hand, increased skill has made cholecystectomy in many instances as safe a procedure as cholecystostomy; in the absence of jaundice the supposed necessity of the drainage of bile is an error, the common duct being clear and the bile passing freely into the duodenum; the need of the gall-bladder for duodenostomy for common duct stricture or pancreatitis is an argument against the indiscriminate employment of cholecystectomy where such conditions are likely to develop.

A second cholecystenterostomy may be necessary in cases where common duct stones require an incision for their removal or when an interstitial pancreatitis is present, and in these cases the gall-bladder should be drained and not removed. In simple cholecystitis the removal of the organ will be preventive of common duct disease.

The indications for cholecystectomy may be summed up as follows: (1) with acutely inflamed or gangrenous gall-bladders due to stone impaction in the common duct; (2) in cases of chronically thickened gall-bladder; (3) with gall-bladders very much distended with clear fluid due to impaction in the cystic duct; (4) when malignant disease is suspected; (5) in chronic cholecystitis without stones, but with moderate thickening and ulceration, the so-called "strawberry gall-bladder"; (6) in chronic cholecystitis without stones but with adhesions to the surrounding organs, resulting in crippling of the latter with the production of symptoms.

E. K. ARMSTRONG.



**Kenny, T. B.: Consideration of a Case of Acute Hæmorrhagic Pancreatitis** (Consideraciones sobre una observacion de pancreatitis aguda hemorragica). *Rev. Assoc. méd.*, Argent., 1916, xxv, 542.

The author reports the clinical details of a case of acute hæmorrhagic pancreatitis with necrosis in a man of 53. The pancreas showed repeated hæmorrhages produced on various days before death intervened. The diffusion of the hæmorrhage is observed from the total central necrosis, from the polynuclear infiltration of the irritated areas, and more particularly by the final apoplexy. The state of the gland corresponds with the period of evolution of the hæmorrhages, showing nothing which might be regarded as being independent of the alterations in nutrition produced by the hæmorrhages.

Kenny's conclusions are as follows: (1) In every peritonitis, the origin of which cannot be traced during operation, the pancreas should be explored. (2) In all cases of obstruction of the bile-passages by calculi in which the symptomatology is similar in character to pancreatitis or which show a grave and atypical clinical picture, the pancreas should be systematically explored. (3) Observations on pancreatitis should be reported in order that a better basis for conclusions may be afforded.

W. A. BRENNAN.

**Balfour, D. C.: The Technique of Splenectomy.** *Surg., Gynec. & Obst.*, 1916, xxiii, 1.

The various steps in routine splenectomy are described, and the points which are emphasized in the procedure are the following:

1. Abdominal exploration, which is particularly necessary on account of the frequent complications of liver and gall-bladder met with in many of the diseases for which splenectomy is advocated.

2. The interposing of a large hot abdominal pack after the spleen has been separated from the diaphragmatic surface, the pack to be left in until the completion of the operation.

3. Careful preliminary division of the gastro-splenic omentum and all accessory adhesions, which greatly facilitates the ligation of the splenic pedicle itself, which may be ligated either *en masse* or in sections, the latter method being preferred if it is safe.

4. In removing the spleen, the fundus of the stomach and the tail of the pancreas should be carefully protected.

The author also states that in ligating the splenic pedicle the advisability of first securing, where it is possible, the arterial supply so that the spleen may empty itself of its contained blood, has been proved in some cases.

Some of the more common conditions for which splenectomy is advised are discussed from the standpoint of the difficulties of the operation, and the author has found it of least risk and difficulty in pernicious anæmia, and probably of greatest danger

in some of the advanced cases of splenic anæmia. Other conditions are mentioned, such as hæmolytic jaundice, cirrhosis of the liver, syphilitic spleen, and idiopathic splenomegaly.

**Giffin, H. Z.: The Treatment by Splenectomy of Splenomegaly with Anæmia Associated with Syphilis.** *Am. J. M. Sc.*, 1916, clii, 5.

Giffin briefly reviews splenomegaly associated with syphilis and reports in detail four cases operated upon in the Mayo Clinic.

Splenomegaly of syphilitic origin is very often confused with other diseases associated with anæmia or splenic enlargement such as hæmolytic jaundice, splenic anæmia of infancy, Gaucher's disease, lymphoma, lymphosarcoma, and others.

Diffuse, non-gummatous hypertrophy of the spleen may occur in syphilis. Enlargement in the early stages is probably quite common but tends to disappear although persisting longer than any other visceral manifestation.

Syphilitic splenomegaly is common during the first eighteen months of life. Up to the age of six months, splenic enlargement appears in 40 per cent of syphilitic babies. Likewise syphilis in infants may be associated with blood findings similar to those of the splenic anæmia of infancy (von Jaksch's disease).

Gumma of the spleen is very rare in children and but slightly more common in adults. In both, syphilitic splenomegaly is usually of a diffuse, non-gummatous character. Also this condition may persist or recur in spite of antisymphilitic treatment.

The author's first case showed severe anæmia; no hæmatemesis; syphilitic infection denied but Wassermann showed total inhibition; no definite improvement under treatment; splenectomy; spleen showed marked splenomegaly with treponemata in walls of vessels. The patient had excellent health later.

The second case showed marked anæmia of the secondary type without leucocytosis; no hæmatemesis; negative history of lues but Wassermann showed total inhibition; palpable gummata in liver; no improvement under treatment; splenectomy; moderate splenomegaly; prompt improvement in health and blood.

The third case gave a positive history of syphilis at 21 with three positive Wassermann tests but negative at the time of examination; slight anæmia; recurrent hæmatemesis; partial relief from treatment; splenectomy; moderate splenomegaly. There was one gumma and a few treponemata in the spleen. The patient was in excellent condition three months later.

The fourth case gave a positive history of syphilis occurring 10 years previous; recurrent hæmatemesis; anæmia of the secondary type; ascites; marked splenomegaly; splenectomy followed by gradual improvement.

Giffin concludes that the results following splenectomy for marked splenomegaly associated

with syphilis and anæmia, performed after a trial of antisyphilitic treatment, seem to have justified the procedure in the instances cited. P. M. CHASE.

**Mayo, W. J.: Surgical Considerations of Splenectomy and Its Results.** *Read at Chicago M. Soc., 1916, Oct. 4.*

Physiologically the spleen is of but moderate importance, and its removal does not cause serious changes in the human economy. The splenic vessels have endothelial coverings only, and the blood comes in direct contact with the splenic pulp giving it the mechanical function of a strainer. The spleen removes from the blood bacteria and protozoa, toxic products and worn-out blood corpuscles, especially erythrocytes. All this material is sent to the liver for destruction of the noxious agents and for conversion into tissue-building substances of such food values as it may contain. While the spleen has been classified with the organs of internal secretion, there is little to substantiate the hypothesis that it possesses internal secretion.

Pathologically the spleen is of very great importance. It is a link in a chain of organs, which, under conditions of disease, produces changes in the blood that may eventually cause death. However, the spleen constitutes only a single and a weak link in the chain, a link capable of being removed. In many instances its removal breaks up a vicious circle and the patient is thus restored to health, even though the spleen itself may be only the agent of the destruction rather than its cause. This conception of the function of the spleen brings into the foreground its relation to the pathology of the blood as a tissue, a tissue composed of leucocytes, erythrocytes, and platelets, the plasma of the blood having the relation of connective tissue.

One hundred and thirty-five splenectomies have been performed in the Mayo clinic for various conditions. Twelve patients died, a mortality of 8+ per cent. This takes into account all deaths that occurred in the hospital after splenectomy without regard to their cause or the length of time they occurred after operation. While the function and pathology of the spleen is more or less obscure, the outstanding fact in these cases was that with one exception the spleen was enlarged and the enlargement concerned those pathologic states with which it was associated.

The enlargement of the spleen may at times be a work-hypertrophy such as occurs in hæmolytic jaundice. In other cases, as in pernicious anæmia, the spleen may have been stimulated to pernicious activity. In splenic anæmia the blood destruction originates within the spleen itself as a result of those agents which cause the enormous growth of fibrous tissue in the spleen and the terminal cirrhotic process in the liver. As the blood picture may not be characteristic the estimation of the relation of the spleen to these various disorders depends largely on our ability to ascertain the physical condition of the spleen. Unless the spleen is enlarged we have at

present no evidences which necessarily denote splenic disease.

A somewhat careful investigation as to the value of percussion in detecting enlargement of the spleen does not sufficiently marked to be detected by palpation does not give percussion as high a place as we have been led to believe it should have. In the large majority of cases little real knowledge of the physical condition of the spleen will be obtained unless it can be felt by careful palpation on full inspiration, with the patient lying on the right side. This is unfortunate, as the spleen must be enlarged several times its normal size to become palpable. Carman is now developing roentgenologic evidence as to splenic enlargement which it is hoped will soon produce reliable information.

In general, the diseases with which the spleen is concerned may be classified in three groups: (1) splenomegalias of parasitic origin, (2) splenomegalias of toxic origin associated with anæmia and cirrhosis of the liver, and (3) splenomegalias associated with blood dyscrasias.

1. Splenomegalias of parasitic origin. Under normal conditions, parasitic agents collected in the spleen are sent to the liver for destruction, the spleen appearing to have little germicidal power. Should parasites accumulate beyond the ability of the spleen to rid itself of them, such secondary conditions occur as are shown in the splenomegalias of typhoid, malaria, syphilis, and tuberculosis. Eventually such cases may come to operation because of the failure of medication to reach the organisms sequestered in the spleen which have a constant tendency to reinfect the whole body.

While a number of cases of typhoid splenomegalias were observed in the Mayo clinic and several cases of typhoid abscess of the spleen were operated on, none of them required splenectomy. There was but one case of primary tuberculosis of the spleen, that of a young girl in whom there was no other evidence of tuberculosis at the time of operation, but who died within six months of generalized tuberculosis.

Four patients were splenectomized for syphilitic splenomegalia. All had histories of lues and positive Wassermanns, and in all cases spirochætæ were found in large numbers in the removed spleens. The patients were markedly anæmic and had failed to improve under salvarsan, neosalvarsan, and prolonged mercurial treatment. Removal of the spleen was followed immediately by an extraordinary improvement in the anæmia. After operation the patients were again placed on antisyphilitic medication and their recovery was prompt and permanent.

2. Splenomegalias of toxic origin associated with anæmia and cirrhosis of the liver. The splenomegalias in this group were due evidently to toxic products which had been removed from the blood and which, passing to the liver, evidently produced hepatic cirrhosis. It is inferred that such toxins are filtered out in the spleen, and it is known that in certain diseases removal of the spleen not only cures the anæmia, but tends also to check the



progress of the cirrhotic process in the liver such as occurs in Banti's disease.

Splenic anæmia is the best understood member of this group. Pathologically, there are many varieties. An enlarged spleen and the secondary type of anæmia, however, are characteristic, although the latter may be absent for long intervals. Gaucher's disease and the pseudoleukæmia of infants or von Jaksch's disease are at the present time best classified with splenic anæmia in this group. There is less evidence to indicate that splenomegalia may be a factor of great importance in the causation of biliary cirrhosis, but the results in the few cases of splenectomy performed in cases of biliary cirrhosis led to the belief that to a certain degree it has a definite relation to the hepatic condition and the latter may be favorably modified, at least in some cases, by the removal of the spleen.

In all, 43 splenectomies were for splenic and allied anæmias (Gaucher, von Jaksch's disease, etc.). Five of the patients died. The mortality in this group was too high and represents badly chosen cases in the earlier experience in the clinic. The mortality should not be over 5 per cent. The improvement that takes place on removal of the spleen in splenic anæmia is surprising. Even in late stages of the condition in which there is cirrhosis of the liver the patients may be apparently cured.

In several cases of splenectomy for splenic anæmia in which there was marked splenomegalia with advanced cirrhosis of the liver and ascites the patients were restored to health — in one instance for a period now of more than six years. One of the typical features of splenic anæmia is the occurrence of hæmorrhages from the stomach. Seventy-five per cent of all the severe hæmorrhages of this kind do not have their origin, as is so frequently thought, in ulcer or cancer but arise from some unknown gastrotoxic condition. These hæmorrhages markedly resemble those of splenic anæmia. Some authorities believe they are the result of unrecognized cirrhosis of the liver, though not necessarily the rupture of enlarged veins. In a very remarkable instance of this kind in which the patient had had a number of operations for gastric hæmorrhage, with recurrence of the hæmorrhage whenever the hæmoglobin rose above 45 per cent, Balfour explored the spleen and found that it was more than twice the normal size. In the liver were some slight changes which might be regarded as a possible early cirrhosis. The spleen was removed; the man gained sixty pounds in weight; his hæmoglobin rose above 80 per cent; and he has been in perfect health for a number of months. It is quite possible that up to the present time we have been recognizing as splenic anæmias only those gross conditions which may be the terminal stages of a more frequent malady.

The resemblance between splenic anæmia with terminal portal cirrhosis of the liver and those cases of portal cirrhosis in which the enlargement of the spleen is apparently secondary to the cirrhosis has led to the removal of the spleen in three selected

cases of advanced portal cirrhosis with splenomegalia, ascites, etc. The operations are too recent for any conclusions, but the two patients who recovered showed remarkable improvement of the anæmia and a lessening of the ascites. In three instances an enlarged spleen associated with biliary cirrhosis was removed. These persons were moderately jaundiced and had large livers and spleens. Their condition has been very greatly improved and they have been able to return to work though two still have a slight jaundice. One is apparently cured.

Leukæmia varies greatly according to the particular group of organs in which the diseased blood production is most marked. We have, therefore, the splenic and lymphatic types. However, recent clinical evidence that cannot be ignored has been brought out which at least leads to the conjecture that leukæmia may be more definitely connected with certain organs than we have been led to believe. In splenic leukæmia (so-called myelogenous leukæmia) for instance, the application of the X-ray at first acts most beneficially in reducing the size of the spleen, decreasing the white cells and improving the anæmia, but later the ray loses such power. Radium applied at several points over the spleen has a much more rapid effect than the X-ray. In two cases applications of radium caused so great a reduction in a huge spleen within a month that it could not be felt beyond the margin of the rib. Coincidentally the white cells dropped from several hundred thousand to less than ten thousand. This leads to the question of whether or not, during the period of abeyance, splenectomy might not have had a further effect in extending the palliation or possibly even curing certain types of disease allied to splenic leukæmia.

An illustrative case is cited of a woman, aged 56 years, suffering from myelogenous leukæmia, who was admitted to the clinic for examination: white blood-cells 203,000; the spleen filled the left half of the abdomen; over the splenic area was an X-ray dermatitis. The history developed the fact that X-ray treatment at first had been of great benefit. The spleen was markedly reduced in size and there was a great reduction in white cells and improvement in the patient's general condition. Later the X-ray lost its effect; the spleen rapidly increased in size, and the leucocyte count went up. The spleen, weighing 1,100 gm., was removed. The outside of the organ was somewhat sclerosed, evidently as a result of the treatment. Apparently the sclerosis prevented further effect from the X-ray on the hyperplastic splenic pulp sequestered in the middle of the spleen. The leucocytes rapidly dropped from 203,000 to under 50,000 in ten days after the operation. Radium treatment followed by splenectomy may be worth a trial in this type of leukæmia.

In the cases in which the spleen was removed for pernicious anæmia it was found enlarged from two to ten times its normal size, with one exception. In this case the patient was in a terminal condition



and the spleen was slightly atrophic (187 gm.; normal 195 gm., Sappey). This suggests that the shrunken spleen found at postmortem may be a terminal condition.

That pernicious anæmia in any great percentage of cases depends entirely on splenic diseases is not believed tenable, but clinical experience has proved that the spleen may be a factor of considerable importance. The removal of the spleen in suitable cases after the failure of other therapy has given rise to prolonged betterment, but splenectomy does not seem to prevent the development of cord changes nor do the pernicious cells entirely disappear from the blood.

In 48 cases of pernicious anæmia in which the spleen was removed there were 3 deaths, which probably were unnecessary, as none occurred in the last 25 operations. The patients who died were in an advanced stage of the disease and were operated on during crises without transfusion. In the operations performed when the patients were on the upgrade or when it was possible to start the upgrade by transfusion there were no deaths.

Hæmolytic jaundice presents a brighter picture than pernicious anæmia and with splenic anæmia represents the triumph of splenectomy. It would appear that the function of breaking down worn-out corpuscles is exercised by the spleen in response to some condition of the red corpuscle itself. Chauffard and Vidal have shown that in hæmolytic jaundice the red corpuscles are more fragile than normal as they circulate in the blood and their fragility is apparently their death-warrant in the spleen. Certain it is that the removal of the spleen in hæmolytic jaundice institutes most marvelous improvement and speedy cure. The jaundice which may have existed for years or possibly for life entirely disappears within a few days, and the anæmia, which is of the secondary type, disappears within two or three weeks.

In conclusion, the fact is emphasized that traditional medicine has named many diseases from symptom-complexes. Patients are more or less carefully observed, a few blood-cells and a little plasma are examined at various times, the patients die and it is assumed that the condition found after death existed during life. The history of medicine is the graveyard of such beliefs. The spleen is one of the latest of the hidden organs to be brought under the eye and investigated during life and in the early stages of the disease. The problems presented are found to be not simple, but rather very complex. In the early stages splenic anæmia may be confused with pernicious anæmia, cirrhosis of the liver, hæmolytic jaundice, and leukæmia. We remove the spleen and say we have cured any one of the diseases we may have fixed upon to designate the condition, but does that make it true? Where is the dividing line which should always exist between hæmolytic jaundice, Hanot's cirrhosis of the liver, and some types of pernicious anæmia? In the terminal stages we recognize the name of the

end-result, but to determine the nature of the disease in the early and curable period requires investigation of the spleen, liver, bone-marrow, and blood during life. To do this judiciously, we must divest ourselves of accumulated prejudices, the result of the nomenclature based on symptoms.

**Pepper, O. H. P., and Austin, J. H.: Metabolism Studies Before and After Splenectomy in a Case of Pernicious Anæmia.** *Arch. Int. Med.*, 1916, xviii, 131.

In brief the results of studies of metabolism before and after splenectomy for various types of anæmia and in normal animals may be summarized as follows: (1) There is little or no change in the total nitrogen metabolism or in its partition, with the exception of a decrease in the uric acid excretion after splenectomy in certain cases. (2) A decrease in the elimination of iron occurs in certain cases after splenectomy. (3) A decrease in the output of urobilin and urobilinogen is noted in certain cases after splenectomy.

This decrease in the daily elimination of uric acid, iron, and urobilin after splenectomy is apparently most marked in those cases in which before splenectomy there has been conspicuous evidence of increased hæmolysis, indicated by abnormally high excretion of uric acid, iron, and urobilin, or by a lemon-yellow color of the skin.

The case reported by the authors was studied in contrast as a case of pernicious anæmia with evidence of increased hæmolysis. The study was limited to the total nitrogen, the uric acid, the iron, and the urobilin and urobilinogen. Three periods were studied: one before transfusion and splenectomy, one two weeks after splenectomy, and the third two weeks later. During each period the patient was on a carefully controlled Folin metabolic diet, and the period was not commenced until the patient had reached an approximate nitrogen balance.

In an adult with pernicious anæmia of a moderately hæmolytic type, splenectomy was followed by disappearance of the discoloration of the skin and by prompt and persistent improvement in the condition of the blood and general health. Metabolism studies before and after splenectomy gave the following results:

1. A slight positive nitrogen balance before splenectomy was followed by an increased nitrogen retention fourteen days after operation and a return to the pre-operative balance after one month.

2. The output of uric acid, although never exceeding normal limits, showed a decrease of 22 per cent after operation.

3. The output of iron through the fæces, although never above normal, showed a decrease of 40 per cent after operation.

4. The excretion of urobilinogen and urobilin in the fæces before splenectomy was about three times the normal; two months after operation the output was about one-seventh of that before splenectomy.

GEORGE E. BEILBY.



## SURGERY OF THE EXTREMITIES

## DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Smith, F. D.: Regeneration of Bone.** *Am. J. M. Sc.*, 1916, clii, 95.

In a very exhaustive article Smith considers the structure and formation of bone and then applies the facts in an effort to explain the behavior of bone-grafts. His conclusions, which are appended, embody to a large extent the substance of the article:

1. Osteogenesis is not a specific attribute of any tissue or layer of cells, but is limited entirely to the osteoblasts which are scattered throughout the entire structure of the osteoblast and the host.

2. Many mature bone-cells are end-products, and while they may undergo mitosis under artificial conditions, this process is unknown in the human economy.

3. Many mature bone-cells of a transplant remain alive, especially near the periphery of the transplant, and control its surrounding calcified matrix.

4. Absorption of isobone is influenced in many cases by the treatment received by the transplant.

5. Protoplasmic poisons should not be employed during bone-grafting procedures.

6. Regeneration of the bone for the most part is an indirect process through the differentiation of the osteoblast into a mature bone-cell.

7. A transplant is subject to the varying demands of its environment, functional demands producing an increase in bone deposition, lack of functional demands causing atrophy and absorption.

8. Bony contact is not essential to regeneration of bone, but for practical purposes doubly insures the result desired.

9. In the transplantation of any bone, the most that can be hoped for is the continued development of the implanted osteoblasts, together with such stimulus as may be obtained from the osteoblasts of the host and the retention of vitality in some of the transplanted bone-cells with their corresponding intercellular calcium matrix.

10. The transplant in the presence of an infection may or may not survive and is dependent upon the type of the infecting agent.

11. The medullary transplant is not a permanent entity, but is absorbed as soon as all functional demands are removed.

FRANK D. DICKSON.

**Cameron, H. C.: Skeleton from a Case of Osteogenesis Imperfecta.** *Proc. Roy. Soc. Med.*, 1916, ix, *Sect. Dis. Child.*, 48.

In the skeleton of a two-months-old child, which the author describes, the frontal suture and both fontanels were widely patent; the skull bones were

very thin, membranous in the temporal region, in which region the bulging above the ears is so prominent in later life. Almost every rib was fractured, some in two places. The pelvis was small and the limbs curved and much deformed with several fractures.

H. W. WILCOX.

**Kidner, F. C.: Causes and Treatment of Perthe's Disease.** *Am. J. Orth. Surg.*, 1916, xiv, 340.

The author is of the opinion that the clinical entity, best called osteochondritis deformans juvenilis, is really a mild infection of hæmatogenous origin of the neck of the femur at the epiphyseal line. He recommends that the logical treatment to hasten recovery and limit destruction is the clearing out of this focus. He cites one case operated upon by himself, in which the results were very satisfactory.

PHILIP LEWIN.

**Picqué, R.: Treatment of Diaphysary Gunshot Injuries in an Ambulance at the Front** (*Traitement des lésions diaphysaires par coup de feu dans une ambulance de l'avant*). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1743.

In diaphysary injuries there are three classes of lesions observed: (1) wounds due to bullets in full velocity striking at a mean distance; (2) shell lesions or those caused by spent bullets at a long distance; (3) wounds due to bullets striking at full velocity at a short distance.

Picqué recommends abstention in the first class of cases. For the second and third classes he recommends subperiosteal judicious clearance of débris from the fractured area, and drainage of the medullary canal as immediate treatment.

By the application of these methods he has been able to narrow the limits of amputation in gunshot diaphysary fractures of 3,785 wounded passing through his ambulance service. Only 3 amputations were done; and among 5,378 hospital patients only about 30 primary or secondary amputations were necessary.

W. A. BRENNAN.

**Tullidge, E. K.: Frozen Limbs and Their Treatment in the Present War.** *Med. Rec.*, 1916, xc, 11.

Cold is probably the greatest hardship and most dreaded enemy the soldiers of both armies on the Eastern war front experience. Frozen extremities, particularly the feet, are by far the most common, and represent during the fall, winter, and early spring months the majority of all cases sent to the hospital or treated at the front. The frequency and common suffering of this condition may be ascribed not only to the biting, intense, continual cold of the mountainous districts, but to a tendency due to the retention of the moisture of the feet, and to the

inadequate blood supply of these points. The arteries should and must be kept warm where they are most exposed, and an endeavor made to prevent the occurrence of trophic and circulatory disturbances that lead to the more serious complications of gangrene, general sepsis, and death. With this end in view, proper and adequate clothing, socks, gloves, and wrist- and ankle-warmers of wool and cotton should be supplied to the troops in quantities large enough to allow of a change at least three times a week when on active duty. Among the foot protectors used are yellow oiled and waxed paper covers shaped to be worn inside the boot. Some men display a predisposition to frost-bite by pathological cardiac conditions and sluggish circulation in general. This should be recognized by the recruiting examiner or the regiment physician and a note made that they should not be sent to exposed parts. It must be remembered that probably the greatest factor of sluggish circulation and a most frequent and important one is fatigue. It is more pronounced, and occurs more easily in cold climates and high altitudes. Relief and frequent changes of the men upon active duty are necessary, and large commodious boots, with no buttons or laces, should be supplied to them. Owing to the scarcity of boots and shoes at the German front large easy-fitting, straw-woven covers with a one or two-inch sole that could be slipped on over the shoes were devised. These proved to be such excellent protection, keeping the feet warm and dry, that later many thousands were made and sent out by the government and the Red Cross.

If early measures are taken to tone up the vessel walls and nerve supply of the legs and feet, frost-bite may be avoided in the majority of cases. This can be done by daily cold baths and massage with snow.

The conditions manifest by the effect of cold upon the feet may progress from simple vasomotor disturbances and minute blisters, to total gangrene of the toes or even of the entire foot and leg. Soldiers standing for hours with their legs immersed in snow or cold water, which many times formed a crust of ice upon its surface, suffered mostly from a vasomotor condition, which if left untreated, resulted in the death of the tissues and gangrene. A great factor in these cases is the persistent wearing by the troops of tight ankle-bands, boots, and puttees; swollen, water-soaked wool and cotton socks that constrict the leg and interfere with the circulation. The feet are swollen, inflamed, red, and blistered, paræsthesia or anæsthesia being present at times. The legs become œdematous above the water-line, and the skin may break, displaying an open serous discharging wound. Some French authors term this affliction "water-bite" but the author believes it to be but a first or primary stage of frost-bite, held in check temporarily by excessive moisture. If these cases are taken out of the water and placed in a dry, warm room the prognosis is better. If they are allowed to remain outside, the dampness aggravates

the condition, producing a maceration of the tissues and causing the shoes to shrink still more.

In the later stages of frost-bite there is a necrosis of the parts involved, usually the ends of the fingers, hands, feet, or toes. It may be classed as a dry gangrene, mummification, or death followed by inspissation if the tissues are bloodless at the time of freezing. However, most of these cases, in fact, practically all of 2,000 that the author saw and treated, underwent a mortification or moist gangrene followed by putrefaction necrosis, accompanied by a great septic reaction and often death if the diseased area was not removed in time. Infection takes place quickly from the slightest break in the skin in the early stages above described and spreads rapidly, accompanied by dysuria, oliguria, hæmaturia, disturbances in sensation of various parts of the body, and disorders in metabolism. The best treatment in this stage of the affection is friction with snow or cold water out in the open, where the patient should be kept for the first twenty-four hours, the change to a warmer atmosphere being gradually brought about. Friction or massage with oil or alcohol—some prefer turpentine, benzine, alum, etc.—should be followed by elevation of the limb upon soft pillows after being wrapped loosely in cotton wool over which is spread boric vaseline. These coverings can be held in place by bandages applied loosely so as to avoid any danger of constriction. Blisters and discoloration of the toes or other parts show that gangrene is imminent. This is the time to apply iodine tincture over the whole surface of the limb extending it far above and if possible below the involved area. The blisters contain a dark, blood-colored serous fluid, and should be opened, carefully dried and dressed with dusting powder, preferably powdered borax, salicylic acid, zinc oxide. Every effort should be made to keep the parts dry and sterile when gangrene sets in. Incisions at or near the beginning of the inflammatory area may be made to allow the escape of accumulated and retained lymph and blood. These incisions should be small, sometimes mere punctures, and extend through to the bone. Following this, a stimulating effect upon the capillary circulation and tissue regeneration will be noticed with resulting diminution and decrease in the gangrenous involvement, thus saving as much of the injured extremity as possible. Immediate, early, or too hasty amputation is absolutely contra-indicated as it is impossible to say how much of the damaged tissues will survive. It is true that a line of demarcation does occur, but the tissues adjoining it become more and more healthy, forming granulations significant of regeneration.

It is astonishing how an apparently serious gangrenous area or spot may contract and slough off, leaving a healthy but infected granulating area. Toes, and even completely involved feet, may regain their color and former healthy appearance in time if properly treated. Operation should therefore be delayed until it is evident that flaps of skin



are available and can be applied conveniently so that they will make a good covering for the stump. The delay, however, should by no means await the spontaneous sloughing of the dead parts, because of the septic systemic infection that invariably accompanies it. The author, in the early days of his service, on the advice of some of his colleagues, waited until cicatrization had accomplished as much repair as it could, allowing spontaneous sloughing, with the result that five men died, who would probably have been saved by earlier operation at the proper time. To operate upon these cases, the surgeon must be thoroughly familiar with the operations relative to amputations and disarticulations of and about the feet and hands, especially the former. Of these, Lisfranc's, Chopart's, Syme's, and Pirogoff's operations are of most value and of great importance in that a fairly presentable limb will result that will be of some use and service in after years.

The plantar flap incision with the horizontal portion of the dorsal incision passes down the outer lateral side of the foot, along the plantar edge of the fifth metatarsal to below the middle, then gradually rounds onto the sole and sweeps obliquely across the plantar surface, crossing the fifth metatarsal just above its neck, and ending at the first metatarsophalangeal joint. The incision is joined to the dorsal incision by an incision running up the midlateral aspect of the foot along the border of the first metatarsal. Care should be taken not to make the dorsal flap too short or either flap too pointed, allowing plenty of soft tissue on the plantar flap to compensate for post-operative sloughing, and not to mistake the scaphocuneiform joint for the metatarsocuneiform articulation.

It is necessary to resort to Pirogoff's operation when the heel of the foot has become frozen and sloughs off with the toes. The intervening tissues on the arch of the plantar surface of the foot that remains in a living condition is often so small or so inflamed that it is not worth saving, and the disarticulation of the foot at the ankle-joint with the removal of the malleoli, the articular surface of the tibia, and the anterior part of the os calcis is necessary. A modified dorsal flap is necessary as a heel-flap is impossible. This if tried will give good results, although a fleshy person will produce a better flap than a lean one. Sometimes the foot is frozen so badly and the area of necrosis so extensive that it becomes necessary to perform Syme's operation, which is indeed a far better operation for both the patient and the surgeon if performed with a dorsal flap.

Care and attention are required in the after-treatment of finger and toe amputations and disarticulations. Exercises, passive and active, should be instituted at the end of the first week to keep up the strength of the muscles, particularly the extensors, for they degenerate faster than the flexors. The remaining fingers or parts of fingers and toes should be left exposed or in a condition of easy mobility so that the patient can keep them continuously work-

ing vigorously to ward off stiffness. Enough of the hand should be left if possible to permit the patient to grasp things with, as there is little comfort in an artificial hand, which is decidedly inferior to a mutilated stump that still has a grasping and holding power. Lastly, when placing the arm in a sling, care should be taken that the hand does not or will not drop from its own weight or receive pressure from the edge of the supporting binder.

**Haller: Articular Gunshot Wounds** (Des plaies articulaires par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1404.

Haller reports his experience based on 74 cases of articular injuries observed by him in the field ambulance service up to last March. He divides these lesions into 4 varieties:

1. Articular wounds with injuries of the soft parts only.
2. Articular reactions in diaphysary or diaphyso-epiphysary fractures with fissure into the joint.
3. Articular injuries with more or less extensive breakage of the articular surfaces.
4. Large disruptions, destruction of the joint with laceration of the muscles, vessels, and nerves.

A different method of treatment has been adopted for each of these varieties. For the first group Haller after disinfecting the orifice uses immobilization and compression. In 5 cases of knee-joint injuries such treatment sufficed. In 2 of these cases the projectile remained embedded, and in 2 other cases subsequent arthrotomy was necessitated owing to infection.

In 9 cases of the second variety arthrotomy was done. In all these cases there was a septic reaction. Haller thinks that in certain cases simple arthrotomy does not suffice and that an early partial resection may be necessary; but this may be avoided by a minute clearance of debris and wide drainage at first.

In the third class of lesions Haller counsels economic resection limited to the soft parts and osseous surfaces. He has made 6 such interventions in the shoulder, 11 in the elbow, 4 in the wrist, 1 in the hand, 1 in the hip, 1 in the ankle, 4 in the foot, and 7 in the knee.

In 10 cases of the fourth group Haller amputated immediately.

The global results in the 74 cases give 15 deaths; 59 patients, or 80 per cent, left the hospital in good condition.

Articular injuries of the knee treated by compression and immobilization were cured without complication. In 16 arthrotomies Haller had only 1 death, a case of suppurative arthritis of the shoulder with fracture of the humerus operated upon the fifth day after injury. In two others an amputation and resection respectively were necessitated subsequently.

Of 35 atypical resections, there were 7 deaths and 28 recoveries. The deaths occurred generally in cases that had other complications. The results in

these resection cases gave 20 per cent mortality, 8.57 per cent of necessary secondary operations (amputations), and 71.43 per cent of recoveries in good condition.

Secondary amputation was necessary 6 times in 55 cases of arthrotomy or resection. Of these 6 cases 4 recovered and 2 died. The immediate amputations of which there were 19 gave 12 recoveries and 7 deaths.

W. A. BRENNAN.

### FRACTURES AND DISLOCATIONS

**Grossman, J.: Fractures in Children.** *Med. Rec.*, 1916, xc, 52.

The author calls attention to the difference between fractures of children and those of adults, the liability to fracture being present without the cardinal symptoms, crepitus, false motion, deformity, etc., and the frequency of deformity following so-called "sprains," "contusions," etc., presenting themselves to the orthopedist.

Intraperiosteal fractures can be made out by carefully following the line of tenderness.

The paper is based on the study of 200 cases of fractures, divided as follows: fracture of the clavicle, 50; fracture of the humerus, 48: (a) surgical neck, 3, (b) shaft, 5, (c) lower end, 40; fractures of the forearm, 92: (a) shaft of the radius, 20, (b) shaft of the ulna, 5, (c) olecranon, 3, (d) both bones, 24, (e) lower end of the radius, 40; fractures of the leg, 10: (a) tibia, 5, (b) fibula, 5.

The following points are emphasized:

1. In treating fractures in children and infants one must always bear in mind the tender skin of the infant, its round agile body, and the movable covering of fat which envelops the soft bones.

2. The tendency to heal is much more pronounced in children than in adults; the time of union is much shorter; and immobilization should be of shorter duration.

3. A certain percentage of fractures in children do exist with the cardinal signs of fracture lacking, the diagnosis being made in these cases by tracing the point or line of pencil or maximum bone tenderness.

4. Where following an injury children refuse for any length of time to use a limb, especially if their attention is distracted from the injury, or when they are at play, the possibility of a fracture should be borne in mind.

5. The necessity of proper retention should always be borne in mind as it is just as important as proper reduction in securing favorable results.

6. Early massage, passive and active movements are very important adjuncts in securing satisfactory results.

H. W. MEYERDING.

**Burnham, A. C.: Sprains and Sprain-Fracture of the Wrist-Joint.** *Boston M. & S. J.*, 1916, clxxv, 118.

In surgical injuries of the wrist three general classes must be differentiated: simple sprain, so

called "sprain-fracture," and gross fracture. A sprain is a partial or complete ligamentous rupture without bony subluxation, but if a portion of the bony attachment is torn away before the ligament ruptures it is a sprain-fracture. The differentiation between these two conditions is not always easy, as shown by the frequency of actual fracture in many "sprains." The symptoms of sprain are pain, loss of function, swelling, tenderness, and ecchymosis; and the symptoms of fracture near the joint are the same, but the character and location of the local tenderness is the diagnostic point, for while in the former the tenderness is most acute over that part of the ligament stretched by the force of trauma, in a fracture there is a peculiarly acute type of tenderness at once elicited over the exact point of fracture even by the slight pressure of the examining finger. The skiagram cannot always be depended upon, especially in green-stick fracture, and epiphyseal separation. If any doubt exists as to the diagnosis, the lesion should be considered a fracture and treated accordingly, and the best treatment is fixation combined with early massage and passive motion. The improvement is more gradual, and the tenderness persists longer in fracture.

R. G. PACKARD.

**Hingston, D.: An Extension Splint for Fractures of the Humerus.** *Brit. M. J.*, 1916, ii, 72.

Hingston's new splint for fracture of the humerus is a simple metallic hoop of aluminum, oblong in shape, 21 by 9 inches, for extension and counter-extension. If the skin of the lower two inches of the arm is intact and below the fracture, adhesive is applied to the arm and attached to the lower bar of the hoop, the forearm being flexed at a right angle and supported by a sling. If the skin of the arm is not intact, or the fracture is lower, extension is obtained by traction applied just below the elbow. Counterextension is obtained by a pad of rubber tubing wrapped in cotton, placed in the axilla and attached to the upper bar of the loop. The pull is kept evenly distributed by the elasticity of the rubber tubing.

The advantages of this splint are its simplicity, easy application, and the ease with which wounds of the arm can be dressed.

R. G. PACKARD.

**Estes, W. L.: Fracture of the Femur.** *Ann. Surg.*, Phila., 1916, lxiv, 74.

The author defines a fracture of any bone as a solution of the continuity of the bone plus an injury which, in the large majority of instances, is a complex traumatic condition consisting of the break in the bone and injury to the soft tissues of the part involved, of greater or less severity.

He says that the great majority of fractures are produced by incoordinate leverage. He gives tables of statistics both British and American showing the number of fractures at different age periods and from his own statistics concludes that the age



period of active hard labor produces most fractures of the shaft of the femur in America.

Under diagnosis he decries prolonged manipulation and careless handling or forceful attempt to elicit crepitus. He says that an X-ray should be taken, and that only such handling as is necessary to the comfort of the patient should be done. He says that all manipulation should be postponed until the physician is ready to apply his permanent dressing, then a general anæsthetic should be given if the patient's general condition will admit of it, and manipulation and permanent splint or dressing applied at once.

He says no physician who cannot give his patient the benefit of a well taken skiagram, or who himself is unable to make a fluoroscopic examination, should attempt to treat major fracture cases.

He remarks that early shock is psychical, and late shock is due to hæmorrhage and describes his method of treatment.

He says that textbook statements are only average statements based on anatomic and mechanical consideration, not noting physiologic and pathologic forces. He discusses treatment under the several regions of the femur, making special points in the treatment of each region. In discussing conservative and open treatment he contends that, in general, a fracture of any part of the femur, except its neck, which cannot be reduced under anæsthesia and retained in position by some proper apparatus by the middle of the second week, should have the benefit of an open operation, unless there are contra-indications, but that the danger of infection is always to be considered and should not be lightly undertaken.

The advantages of the operation are: (1) that he can direct ocular examination of the condition of the fragments; (2) reposition and fixation by direct splinting of the bone; (3) evacuation of the blood and detritus from about the fragments, (4) a condition almost painless during after-treatment and convalescence; (5) much more freedom of movement in bed is afforded during convalescence; (6) earlier employment of passive movements and massage is possible.

The article is worthy of very careful reading.

JAMES O. WALLACE.

**Nix, J. T., Jr.: Intracapsular Fracture of the Femur; Suggestion as to Diagnosis and Treatment.** *N. Or. M. J.*, 1916, lxxviii, 768.

After reviewing the cases at the charity hospital for a period of ten and one-half years, the author reaches the following conclusions:

1. One in every six fractures of the femur is of the intracapsular variety.
2. Fracture of the femur is rare in the negro.
3. Sex and the side on which the fracture occurs seem to offer no predisposing factors.
4. It is practically absent in childhood, common in adolescence, rare in the young adult, and frequent in old age.

5. The mortality is comparatively low and is limited to advanced years.

6. Diagnosis is sometimes difficult and should whenever possible be verified by the X-ray. The fracture should be treated as a fracture, consistently and logically; viz., reduction by extension, alignment by abduction, and immobilization by fixation with plaster cast.

LLOYD T. BROWN.

**Second, E. R.: The Operative Treatment of Simple Fractures.** *Canad. M. Ass. J.*, 1916, vi, 598.

In the author's opinion the trend of surgical opinion and practice is away from the bone-graft and back to the metal-plate. The two main objections to the inlay graft are: (1) the great amount of manipulation necessary to obtain and place the graft, the greater area of bone exposed, and the increased disturbance of the neighboring muscular attachments, and (2) the difficulty of accurately retaining the graft in place.

The author believes that the failures in the use of steel plates are largely due to defective technique, and he emphasizes the fact that the degree of asepsis necessary in bone work is far greater than for abdominal surgery.

H. W. WILCOX.

**Groves, H.: Some of the Principles and Problems Related to the Treatment of Gunshot Fractures.** *Brit. M. J.*, 1916, ii, 65.

A gunshot wound presents two stages: a wound complicated by a fracture, and a fracture complicated by a wound. While neither wound nor fracture can be neglected, the wound claims first attention and must be rendered healthy before completing restitution of the bone. From the first the limb must be immobilized, and so placed that the wound may be readily dressed without change of position. Within forty-eight hours of the injury every wound, except the clean through-and-through bullet wound, should be disinfected by excision and the removal of foreign bodies, but after a period of ten days, disinfection seems hopeless, and only those wounds should be opened up in which infection seems active. Immediate operation should be done in cases of irregular temperature, local tenderness, rising leucocyte count, and an infection by the streptococcus, bacillus pyocyaneus, or gas-producing bacteria. The whole track of the wound should be laid wide open and left gaping without, if possible, drainage tubes or wicks.

As to amputations in desperate cases, the wound should be opened by a transverse incision, and amputation done later if necessary. Thus in two stages, both shock and sepsis are diminished, and recovery may more often occur before amputation. If more than four inches of bone are lost, if fragment bone-ends are devitalized, and if there are signs of septic absorption, amputation is advised.

Septic shell wounds should be opened at once, but a bullet wound should not be explored except for primary drainage in sepsis. Unless loss of vitality can be proved, bone fragments of the shaft should

remain, but bone fragments at the joints should be freely excised.

As to traction treatment it is better to delay full extension until the wound is healthy as shown by the amount of granulation tissue, meanwhile trusting to complete immobilization and sufficient extension to maintain the same. By this delay, drainage is better on account of less tissue tension, and secondly, during the limited time, six or eight weeks, that adequate extension can be applied, it will be applied when union is actually taking place. For extension Groves condemns the Thomas knee-splint as not having constant or sufficient tension, and advises constant weight extension of fifteen to twenty pounds. Transfixion of the os calcis is also strongly recommended.

In cases of old ununited or malunited fractures, open operation must be resorted to. The false union must be broken down, transfixion or double transfixion or extension applied, and the bone ends must be refreshed, aided perhaps by parallel saw cuts in the long axis of the bone, thus opening up the osteogenetic layer of the bone. Plates or wire may be used, or if correctly applied, bone-grafts. The bone will grow better with periosteum attached and it must be firmly implanted over a wide and vascular area. The graft should be firmly fixed by metal fixation rather than by animal ligatures.

R. G. PACKARD.

**Stone, C. A.: Subluxation of the Head of the Radius.** *J. Am. M. Ass.*, 1916, lxvii, 28.

The author reports a case and his observations of anatomic experiments with this condition.

The literature of the subject is carefully covered and the results of his findings are best stated in the conclusions of the article, which are as follows:

Subluxation of the head of the radius can occur while the biceps is contracted, with the forearm flexed and without adduction. It occurs only while the hand is pronated. The line of traction is parallel to the shaft of the bone. Supination is resisted because the tense lateral ligament forces the flattened side of the radial head against the anterior edge of the lesser sigmoid articulation and the inner attachment of the annular ligament. Attempts at motion throw the exposed two-thirds of the long axis of the head against an already tight ligament, making it more tense. Complete pronation is possible because the short part of the long axis is behind and moves outward against the loose posterior portion of the lateral ligament.

C. C. CHATTERTON.

## SURGERY OF THE BONES, JOINTS, ETC.

**Fourmestraux: Resection of the Shoulder in War Surgery** (Résection de l'épaule par incision postérieure en chirurgie de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1677.

Among 1,300 ambulance patients Fourmestraux found 41 shoulder injuries with isolated or simulta-

neous lesions of the humeral head of the scapula and of the clavicle; in 11 of these resection was necessary.

In these 11 cases of resection of the shoulder Fourmestraux made a vertical incision starting from the acromioclavicular articulation. This incision was continued behind and below on the spine of the scapula. The acromioclavicular articulation was bared; the acromion temporarily detached; the capsule opened; the humeral extremity more or less resected, the circumflex nerve having been pulled down out of the way for protection.

This incision allows a good exploration of the scapula and the removal of crushed parts of the supero-external angle, an injury which is often a concomitant. It allows good drainage also.

The end-results cannot be stated by the author at the present time but he hopes to report later.

W. A. BRENNAN.

**Cotte, G.: Primary Resection in the Treatment of Articular Gunshot Wounds with Fracture** (De la résection primitive dans le traitement des coups de feu articulaires avec fracture). *Rev. de chir.*, 1916, li, 385.

Cotte shows the results obtained for each joint in the treatment of articular injuries with fracture by means of resection. From this study he deduces the conditions in which resection should be employed, in what cases it should be reserved, and at what time it should be practiced.

A general study of articular wounds, such as are observed at the front, shows that these are of three types. The first comprises those which fall into the abstention class. These comprise bullet wounds with punctiform orifices. In these the lesions almost always heal in an aseptic manner providing no hasty maneuvers are used. The treatment should be rigorous immobilization of the injured joint in a plastic jacket, and not the least injection should be made into the trajectory under pretext of disinfecting it. Of 78 articular wounds with fractures treated by Cotte, 15 were of this class, and abstention has always given good results.

Although the end-results are generally good, yet in certain cases such as those in which a wedging of the articular surface, difficult to reduce, exists, a prudent and experienced surgeon will intervene after some days to effect reduction of the fracture, etc. It suffices to say that the aseptic evolution of the wound is compatible with all operative measures.

The second type comprises those injuries which call for early amputation. Such are ruptured and crushed joints in which the soft parts are so badly damaged that a conservative operation can scarcely be thought of, with vascular concomitant lesions and the consequent expectant development of grave infection. Moreover, this class includes those cases in which the patient's general state is too feeble to permit a much longer conservative intervention.

Of the 78 articular wounds treated 14 were of this type. Of these amputations 8 were due to the



primary condition. In the other 6 an early and better treatment would have avoided it.

Aside from these two types the author is of the opinion that all other articular wounds call for resection. His experience at the front has convinced him that the simpler procedures of widely opening up the wound and clearing it out do not suffice. Resection does all that these operations do and does it better and the end-results are much more satisfactory. The clear and regular surfaces due to resection are better than the irregular surfaces left in a ripping up of the wound. Again the facts justify it. Of the 45 cases treated by resection, only 2 have died. The facts in these 2 cases (alcoholism and embolism) show that a more conservative treatment would not have averted these results.

As regards end-results there can be no doubt but that after resection the wounded recover much more simply and rapidly than after clearing operations. Regarding the orthopedic results of resection the small number of cases operated upon by Cotte is not sufficient to authorize him to affirm the superiority of resection over conservative procedures. While *à priori* it must be admitted that many resected joints will not recover their mobility, or the limb may recover with imperfect functioning, yet a limb only partly useful is better than no limb, and it can be said that resection will almost certainly obviate infection or check the results of it.

Regarding the time of intervention and the method, resection should be as early as possible, as it is impossible to say what will be the evolution of an articular injury after its occurrence. The author has recourse to the subperiosteal method following the general rules of resection laid down by Ollier. The anatomic route is selected which allows the largest exposure of the articulation while avoiding the nerves, muscles, and tendons. With these limitations, the resection will be as economic as possible.

Cotte gives the clinical details of several cases of different articular lesions treated by resections to illustrate his contentions. W. A. BRENNAN.

**Marchak and Dupont: Treatment of Traumatic Arthritis of the Knee** (*Traitement des arthrites traumatiques du genou*). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1387.

The memoirs of these two authors were reported on by Delbet who pointed out that they were totally at variance with each other. Marchak sustains four points: (1) the necessity for early arthrotomy; (2) for large arthrotomies to follow Delbet's technique; (3) the utility of extension after arthrotomy; (4) the inconvenience of systematic resections. Dupont abstains from all interventions, immobilizes the limb and packs it in ice. He was led to adopt this technique by the bad results from arthrotomy.

Marchak cared for 15 cases of purulent arthritis of the knee. Of these 1 died from tetanus, and 1 from repeated hæmorrhages. In 4 cases amputa-

tion was necessary. There were 9 recoveries with ankylosis. Besides these 15 cases he had 3 other cases in which early arthrotomy was done at the field hospital. In these 3 cases evolution was simple and they are now without complication. Marchak therefore concludes that the knee must be opened on the least showing of articular reaction.

Dupont treated 7 patients with immobilization and ice pack. One died on the fifteenth day from purulent arthritis, arthrotomy followed later by amputation having been tried in vain. The other 6 cases recovered. All these were severe cases and in 5 of them a projectile was lodged in the articular cavity. In 2 cases these were not extracted and in the others the extraction was only made secondarily when the articular reaction had completely disappeared.

In discussing these contrary reports Delbet states that the end sought in making a large opening of the knee is not the removal of a foreign body but the avoidance of infection. Infection is not constant, and its frequency cannot be stated with precision, but its presence may be detected by making a pyoculture. The result of this will absolutely set at rest all questions as to abstention or intervention. This will not take more than three to five minutes. If microbes are found then a simple arthrotomy is made. If not, the limb is immobilized and examination again made the next day. If streptococci are abundant in the pus wide arthrotomy will be done. If there is a foreign body in the articulation it is preferable to remove it at once, but the question of suturing, draining, or leaving the wound open depends as before on what is found in the pyoculture. Osseous lesions in themselves do not afford any special indications. Infection and the patient's resistance must be the guide.

Delbet's personal experience in treating knee injuries according to this procedure is not large. Of 17 cases, 4 were aseptic and cured without arthrotomy. In 3, simple arthrotomy was done, the pyoculture being weakly positive. The 3 recovered but one was ankylosed. In the other 10 cases the pyoculture was strongly positive, and all had osseous lesions. In all these, wide arthrotomies were made with immobilization and extension. In 1 case a resection was done. Five of these patients recovered without ankylosis; in 4 it was necessary to amputate. In three of these amputation cases the course was adopted because while the patient's resistance was declining, the successive pyoculture showed increase in the number of microbes. All the patients recovered. Pyoculture therefore while it indicates abstention in a certain number of cases, suggests intervention when necessary in infected cases, and limits it to the resistance of the patient.

W. A. BRENNAN.

**Whitman, R.: Treatment of Unstable Cartilages of the Knee-Joint.** *Med. Rec.*, 1916, xc, 145.

Whitman considers displacement of the internal semilunar cartilage quite common. The internal



cartilage is the one affected most frequently because it is more closely attached to the lateral and capsular ligaments and is subject to greater strain by the lateral mobility of the joint, especially in external rotation of the tibia on the femur or internal rotation of the femur on the used tibia with the knee flexed. This movement throws a sudden strain on the internal lateral ligament, whose deeper layer is attached to the cartilage which tears the latter loose and displaces its anterolateral portion backward into the joint where it is caught between the bones when the limb is extended.

The injury usually occurs during violent exercise and is accompanied by a feeling of something slipping in the joint, severe pain, and inability to extend the knee. Effusion soon appears.

Whitman considers that while violence is the immediate cause, weak feet, weak muscles, and faulty attitudes must be considered as predisposing causes, especially in women.

The fact is emphasized by the author that recurrent displacement, which so frequently occurs, or failure of reduction may lead to serious joint injury with disability and later chronic arthritis and even the development of a tubercular condition.

While recognizing that the condition can be treated successfully in a certain percentage of cases by a brace, Whitman advises operation as the best method of dealing with these luxations.

The operation is not dangerous in competent hands, and if all the injured cartilage is removed cure is certain. Operation with the knee in a flexed position, hanging over the edge of the table, and an incision between the patella and internal condyle slightly converse forward is advised. After-treatment consists in fixation in a plaster splint in slight flexion for two weeks and a wedge in the sole of the shoe or a foot-plate if valgus is present. Cure should be complete in a few weeks.

FRANK D. DICKSON.

**Henderson, M. S.: The Transplantation of Bone in Ununited Fractures of the Shaft of the Humerus.** *Ann. Surg., Phila.*, 1916, lxxiii, 464.

From the records of the Boston City Hospital, it would appear that fractures of the humerus were more frequent than fractures of any other bone except the radius. From an experience in handling ten ununited fractures of the shaft of the humerus, the author concludes that the transplantation of bone is much the quickest way of obtaining a good result, and that if proper care is taken a perfect union will result in almost every case. The inlay method is the one of choice in obtaining union. The transplant must be as large as is practical (6 inches by one-half inch or larger). It should extend well past the thinned decalcified ends into the hard, healthy bone beyond. By removing the graft from the flat internal surface of the tibia, the strong crest of the bone is left to perform its weight-bearing function, and the patient may be allowed to walk in twelve to fourteen days. Adequate post-op-

erative fixation is most essential. A split plaster-of-Paris spica prepared a few days before the operation can be fastened on with adhesive strips immediately after the operation is completed, thus eliminating the difficulty of applying the spica under an anæsthetic, and the danger of disturbing the graft thereby. Two or three weeks later, a new cast can be carefully applied with the patient sitting up. A properly applied spica cast may be comfortably worn for three months, when in all probability union will be complete.

GATEWOOD.

**Jones, R.: Transplantation of Bone, and Some Uses of the Bone-Graft.** *Brit. M. J.*, 1916, ii, 1.

Jones reviews the theories of regeneration of bone and discusses the technique of bone-graft.

Whether new bone comes from the periosteum of the graft, or from the bone itself, or from the old bone via the graft as a scaffold, we do know that for successful results autogenous grafts including both periosteum and medulla when possible are far superior to grafts from the lower animals or from a different individual. Adequate blood supply for the graft and thorough asepsis are essential, the area of the graft must be free from unnecessary blood-clot, the surfaces to be apposed must be freshened, and perfect immobilization for twice the time required in an ordinary fracture is very important for early union. Modified or guarded exercise during immobilization promotes growth.

In military surgery bone-grafts are used to replace bone destroyed by such infection as acute osteomyelitis, or bone destroyed by gunshot wounds, or to immobilize injuries of the spine in tuberculous arthritis, or as substitutes for plates and screws.

Jones describes the technique thoroughly. He prefers the tibia and the double circular saw of Albee when possible, and strongly advises against putting the graft into any saline solution. The Albee and Hibbs operations are given in detail. Jones opposes operative interference in simple fractures, except in spiral fractures of both bones of the leg, and here prefers the sliding inlay method of Albee, but describes also the lateral graft and intramedullary plug.

Hasty conclusions that union is not taking place in a bone-graft must not be reached, for with consequent relaxation of strict fixation, delayed union may mean non-union.

R. G. PACKARD.

**Jacobs, C. M.: Autogenous Bone-Splints in Fractures and Tuberculous Spines.** *Med. Council*, 1916, xxi, 39.

The author gives a very sound and conservative outline of operative treatment in fractures and spinal disease.

The advantages of autogenous bone-splints are as follows:

1. In fractures, (a) it affords a means of re-pairing bones and obtaining functional results where other methods fail; (b) apposition of the fragments is easily maintained; (c) not being a for-



eign body, it is not resented by the tissues; (d) it neither causes osteoporosis of bone nor delays callus formation and ossification; (e) it stimulates the bone to which it is contacted, resulting in a firmer and better union; (f) the technique is simple and requires only the usual aseptic precautions.

2. In tuberculous spines, (a) it affords early relief from discomfort and pain; (b) it shortens the period of disability; (c) in selected cases it promises a far more rapid cure than by conservative treatment; (d) it prevents deformity; (e) it prevents existing deformity from becoming exaggerated; (f) it shortens the period of protective treatment such as is given by casts or braces.

H. W. MEYERDING.

### ORTHOPEDICS IN GENERAL

**Morton, D. J.: Questions Relative to the Feet and Their Care.** *Hahneman. Month.*, 1916, li, 405.

The author discusses the mechanics of the normal and the weak foot, the latter as seen in fly-foot or splay-foot and pigeon toe. Some of the points discussed are (1) standing in equilibrium; (2) running and jumping; (3) should the toe or heel be placed on the ground first in walking? In regard to the latter he believes that "placing the toes to the ground first produces a backward and downward movement of the ankle-joint opposing the direction made by the moving body. This is mechanically faulty and calls for undue effort."

As for rubber heels the author says they are frequently more harmful than helpful in the abnormal foot.

In regard to heels in general he says that high heels tend to cause a shortening of the Achilles

tendon. This shortening is of importance in that by its action on the posterior part of the foot it tends to depress the arch of the foot; therefore heels should be lowered gradually.

The author gives the following suggestions in regard to proper shoes: (1) Shoes should be sufficiently wide across the region of the head of the metatarsals. (2) The width across the heel should be only such as can comfortably enclose it allowing for the lateral expansion of the soft structures under weight. (3) Across the instep the fit should be snug as there is no expansion in this region. (4) The inner line of the shoe should be straight following the line of the foot and great toe. (5) Under weight the foot lengthens and as the heel is raised the toes are pushed forward a little more. Sufficient room for all this should be given and it should be not less than a full half inch.

LLOYD T. BROWN.

**Elliott, G. R., and Boorstein, S. W.: Orthopedic Treatment in Hemiplegics of Long Standing.** *J. Am. M. Ass.*, 1916, lxvii, 31.

The authors urge that the orthopedic treatments be started early in cases of this kind. Improvement will continue months and years from the onset. They report a case of twenty-five years' standing, with marked deformities, in which great improvement was made, and they emphasize that there is no time limit for improvement—no matter how old or how long neglected the case.

Deformities should be prevented by orthopedic appliances if they have been allowed to occur. General orthopedic measures, tenotomies, forcible correction, massage, splints, plaster-dressings, and orthopedic instruments should be used in their correction.

C. C. CHATTERTON.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Hammond, R.: Certain Aspects of Injuries of the Lower Back.** *Am. J. Orth. Surg.*, 1916, xiv, 484.

The author divides injuries of the lower back into two general classes.

1. Those cases where there has been an actual bone injury, such as fracture of the body, transverse or spinous process of the vertebra, often associated with a partial luxation of one vertebra or another, or the slipping of an intervertebral disc.

2. Cases of severe wrenching and strain due to partial or complete rupture of ligaments, relaxation of the sacro-iliac or lumbosacral joints, associated with peri-arthritis, periostitis, and myositis of the structures involved.

Both classes of cases show, in varying degree, muscle spasm, localized tenderness and induration, restricted motion of the spine and hips, and atrophy of one or both thighs.

The author considers only those cases of severe wrenching and strain of the lower back without demonstrable fracture.

In a large majority of cases the roentgenogram is of little or no help.

In the treatment he has used adhesive strapping, plaster jackets and spicas, back braces, pelvic belts, electric light and hot air baths, massage, liniments, etc. Improvement was only temporary. Well fitting jackets and spicas were badly tolerated by the patients. It was found necessary to remove them within a week or two in nearly every case.

PHILIP LEWIN.

**Elsberg, C. A.: Some Technical Features of Laminectomy for Spinal Disease and Injury, Based on One Hundred and Fifty Spinal Operations.** *J. Am. M. Ass.*, 1916, lxvii, 168.

The author concludes that the complete removal of the spinous processes and laminae is the simplest method for opening the spinal canal and that exaggeration of the symptoms of spinal disease should rarely follow laminectomy, unless the cord has been incised. He believes in a wide opening of the spinal

canal, to give plenty of space. Careful attention to the appearance of the cord and nerve-roots in both normal and pathologic conditions is required of the spinal surgeon. He must be able to recognize gross abnormalities and the finer changes which occur in spinal disease. The changes in color, the congestion, inflamed hyperæmia, or engorgements of vessels or an anæmic condition must all be noted.

The mortality of laminectomy in all the author's cases was ten per cent. Some of these, however, were suffering from hopeless diseases so that he believes the mortality should be only about three per cent in individuals who have not a spinal disease which would otherwise be rapidly fatal without operative interference. C. C. CHATTERTON.

**Auvray: Extraction of a Shrapnel Bullet from the Third Lumbar Vertebra** (Extraction d'une balle de shrapnel située dans le corps de la 3e vertèbre lombaire). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1789.

Reports of foreign bodies extracted from the vertebræ are rare. Auvray reports such a case in a soldier struck by a shrapnel bullet in the lumbar region a little to the left of the median line. The bullet had become encrusted in the vertebral column. Radiography showed it inserted in the body of the third lumbar vertebra at its superior and left lateral part.

Four attempts at extraction had already failed, the only result being the formation of lumbar fistulæ. Auvray succeeded in removing the bullet by utilizing

the paravertebral route. The post-operative course was normal. A small fistulous tract still persists, but the author believes it will close in due course of time.

W. A. BRENNAN.

**John, R. L.: Treatment of Caries of the Spine by Bone-Transplants.** *Am. J. Orth. Surg.*, 1916, xiv, 450.

The author reports 23 operated cases with the following results: excellent 7; moderately good 3; poor 1; indifferent as to operation 8; died as a result of operation 1; not traced or too recent to consider 3.

Combining the excellent and moderately good results 50 per cent of the patients were improved.

In 7 cases the dorsal region was involved; the dorsolumbar in 10; the lumbar in 4; and the lumbosacral region in 2 cases.

The author believes the operation should not be done on a patient under five years of age.

As a rule, those patients who were benefited were those who were seen and operated upon a few weeks or months after symptoms were first noted. As a part of the operative treatment they were put to bed, with extensions, fresh air, and forced feeding, and later wore plaster jackets followed by braces for a year or more.

He thinks the danger of arousing and disseminating a more or less latent infection by the trauma of the operation is more grave than has been generally conceded. In several cases the disease is arrested locally but not generally, that is, it may appear in a new focus.

PHILIP LEWIN.

## SURGERY OF THE NERVOUS SYSTEM

**Bonnet, P.: The Isolation and Protection of Nerve-Trunks in Operations for Restoration of the Nerves** (De l'isolation et de la protection des troncs nerveux dans les opérations de restauration des nerfs). *Lyon chir.*, 1916, xiii, 529.

Operations for re-establishment of the functions of injured nerves are reducible to three principal procedures: (1) liberation of the nerve-trunk; (2) restoration of the injured part of the nerve; (3) isolation of the nerve-fibers and protection of the nerve-trunk.

Bonnet is concerned only with the last. Isolation of the nerve-fibers can be realized in an ideal way by suture of the neurilemma. Anatomically this constitutes for the contained nerve-fibers a serous sheath like the synovial of the tendon or the peritoneal covering of the intestine. In wounds of the nerve-trunk the neurilemma is opened and the fibers herniate through this serous covering and adhere to the neighboring tissues, most frequently to the muscles. It is almost always possible after liberation of these adhesions to bare the edges of the neurilemma and after reintegration of the fibers

to suture the neurilemma with fine catgut and thus realize the ideal isolation of the nerve-fibers.

It is not always possible, however, to obtain a perfect restoration of the neurilemma. Almost always, as a complement of the suture of the neurilemma when this is realized, and always indispensable when the suture is not realized it is necessary to practice isolation and protection of the nerve-trunk. Many methods of effecting this have been attempted (1) by creating in the nerve-trunk an artificial trajectory which isolates it from the cicatricial tissue, (2) by protecting it by means of isolating sheaths; that is, the formation of an envelope by the aid of veins, absorbable tissue, metallic or other tubes, etc.

Bonnet has employed several of these procedures but now he confines his choice to grafts of fatty tissue and grafts of hernial peritoneal sacs. In the cellular tissue graft the antero-internal face of the thigh is rendered aseptic and protected by iodine till the last moment. An incision parallel to the sartorius muscle is made. The bistoury is inserted under each of the lips of the incision cutting the



fatty tissue into a rectangle of the required size. This is slipped under the nerve-trunk, the lamellous face toward the trunk; it is then rolled around the nerve and sutured with fine catgut to the neurilemma or sometimes sutured to the neighboring muscles.

For some months past Bonnet has also used hernial sacs in similar cases. On the date fixed for operation some hernia patient is operated upon in the same place, and the hernial sac is preserved in warm serum for the nerve operation. After liberation of the nerve and suture of the neurilemma in the recipient the hernial sac is split longitudinally and slipped under the nerve-trunk, the serous face toward the nerve and the edges sutured with catgut around the trunk. If it is a question of a complete section of the nerve the sac is not split longitudinally, but simply opened at its extremity. One of the ends of the nerve-trunk is introduced into one of the orifices of the sac and the edges of this orifice fixed circularly to the neurilemma about 2 cm. from the free extremity of the nerve. If required, the sac may be turned up and an end-to-end suture of the sectioned nerve made. Then the sac rabbetted on the suture is drawn on the inferior end and fixed circularly to the neurilemma far beyond the lesion. To reinforce the suturing of the sheath and help the approach of the two nerve-ends some strengthening sutures are necessary, fixing the neurilemma to the sac wall 1 cm. from the extremity of each free end.

In all cases in which Bonnet used this method cicatrization was obtained by first intention. The

hernial sac graft is indicated according to the author more particularly in restoration of the sciatic and external popliteal and in the isolation of the median and cubital in the arm and of the sciatic in the thigh. The fatty tissue graft finds its indications whenever a nerve must be separated from the vicinity of a fracture, such as in paralysis of the radial.

The author briefly refers to some difficulties which may be met in the execution of these methods.

W. A. BRENNAN.

**Sharpe, N.: Intradural Nerve Anastomosis in Selected Cases of Poliomyelitic Paralysis.**  
*N. Y. M. J.*, 1916, civ, 14.

The object of this new operation is to secure restoration of function to paralyzed muscles by intradural anastomosis of a nerve-root whose motor cells are active to a paralyzed nerve-root. The roots Sharpe selected in all his cases were those of the twelfth dorsal, or the first and second lumbar, because their normal function could be readily dispensed with. This operation is especially indicated in more or less complete paralysis of one or both lower limbs where little if any improvement can come from tendon-transplantation or from braces.

Three cases are reported but not enough time has elapsed to draw any conclusions. All were cases of flaccid paralysis; all were done in two stages: (1) laminectomy, and (2) section of the dura and nerve-suture.

R. G. PACKARD.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

**Bulkley, L. D.: Cancer as a Non-surgical Disease.**  
*N. Y. St. J. Med.*, 1916, xvi, 292.

While laboratory and other investigations have not demonstrated any single cause of cancer and have yielded only negative results, they have, by elimination, cleared the way for a study of its cause along other lines which are bright with promise. They have also established certain facts which confirm the views which, from time to time, have been briefly expressed by many who were best acquainted with cancer, namely, that, because of its constant recurrence, and from the failure of surgery to check its rising mortality, it must be of a constitutional nature, intimately associated with dietary or nutritional elements.

The positive results of laboratory investigation are more encouraging:

The local mass represents only a deviation from the normal life and action of the ordinary cells of the body.

Microscopic study has shown that there is a certain change in the polarity of cells about to be cancer-genetic, with an altered relation of the centrosome to the nucleus. These changes are again attributed to an alteration in the enzyme contained in the cell, which further depends on the nutrition of the cell as influenced by a faulty metabolism of food elements.

The exclusion of all other possible causes leads us, naturally, to look to a disordered metabolism as a cause of the disturbed action of the hitherto normal cells, and we find much to confirm this view, both in laboratory studies on the biochemistry of cancer and also in clinical and statistical observations.

Laboratory and clinical evidence demonstrates that the secretions and excretions of the body, both in early and late stages of cancer, exhibit departures from normal which deserve consideration.

As all healthy cells of the body, by their catabolism and anabolism contribute a hormone or something to the general circulation, so experimental evidence shows that the cells of a cancer mass itself, when fully developed, secrete a hormone or

something which is poisonous to animals and which probably hastens the lethal progress of the disease.

Repeated laboratory experiences have demonstrated the absolute controlling effect of diet on the development of inoculated cancer in mice and rats so that the process was inhibited almost entirely with certain vegetable feedings.

It is thus seen that as the laboratory has eliminated the local nature of cancer, it has also, in a measure, established the fact that there are medical aspects of the disease which further studies will show to be of the utmost importance.

The increase of cancer seems to depend largely upon the altered conditions of life, particularly along the lines of self-indulgence in eating and drinking and in indolence.

Statistics from many countries show that increase in the consumption of meat, coffee, and alcoholic beverages appears to be coincident with a very great and proportionately greater augmentation of the mortality from cancer.

At present no clear demonstration is possible of the direct method by which errors of metabolism affect the changes in cells to which we give the name malignant, any more than we know how other alterations in the body are produced, such as arterial degeneration, bone changes, obesity, etc.

The results which have been observed in connection with the starvation of cancer, by ligature of vessels, illustrate the relation of the blood supply to growing cancer.

The medical aspects of cancer thus appear in quite a different light from that in which they have been commonly viewed. We now begin to see some of the reasons why cancer is not primarily a surgical disease and some of the lines along which observation and investigation should proceed, namely, biochemistry, secretory and excretory derangements, metabolic disturbances, diet, etc.

EDWARD L. CORNELL.

**Gillette, W. J.: Superheated Steam in the Treatment of Superficial Cancer.** *Med. Council*, 1916, xxi, 31.

An account is given of the treatment of superficial cancer by means of superheated steam. The author has been using the method for two years and to date has treated twenty cases. In his opinion steam cannot replace surgery in the treatment of internal cancer nor can it take the place of the heat treatment in cancer of the uterus. In most instances the author used the knife or electric cautery in conjunction with the steam. Its advantages are as follows: (1) The odor of a suppurating cancerous mass disappears at once. (2) By destroying the sensory nerves in the location pain is eliminated. (3) Because of the texture of cancer growth the steam used at 50 to 55 pounds pressure penetrates more deeply than might be supposed. Cancer-cells are more susceptible than normal cells to increased heat. Hence the destruction of cancer tissue is wider than the application of the steam. HARRY G. SLOAN.

**Reyn, A.: The Use of Artificial Chemical Light in Lupus Vulgaris** (Ueber die Anwendung des kuenstlichen chemischen Lichtbades bei Lupus vulgaris). *Tr. XI North. Surg. Cong.*, Goeteborg, 1916, July.

The author reports his results in the treatment of lupus vulgaris with artificial chemical light baths which he commenced in 1913. He first briefly reviews the history of the light bath and emphasizes the fact that methodical use of light was first made after Finsen conducted a rational investigation of the action of light upon the organism. Bernhardt and Rollier were the first to employ sunlight in the treatment of surgical tuberculosis. While there has been considerable difference of opinion regarding the action of light, all seem agreed that the chemical rays of light are important in the treatment, and on that account sanatoria have been established in high altitudes where the rays of the sun are rich in chemical properties. In the northern lowlands this treatment has not been instituted on account of the low chemical value of the sun's rays and therefore the artificial light has been introduced in the therapy.

The author made some attempts in this direction and employed the artificial sunlight obtained from either the mercury arc lamp or the carbon arc lamp. He discusses the technique and emphasizes the fact that a vast difference exists between light from the mercury arc lamp and that from the carbon arc lamp; the former light contains only very weak penetrating outer ultraviolet rays, whereas the carbon arc lamp light contains all of the different qualities of rays and is capable of penetrating much deeper into the skin. There is also considerable difference in the erythema they induce; the mercury arc lamp light producing a bluish-red erythema, whereas the carbon arc lamp light produces a severe red erythema.

This difference must be due to the difference in penetrability between the two lights. The mercury arc lamp light dilates only the most superficial capillaries, whereas the carbon arc lamp light dilates the deeper capillaries also.

In discussing his cases Reyn states that the cases chosen for study were all old and chronic cases which for years had been treated with various methods without success. Of the 72 patients treated with the carbon arc lamp light 52 were cured; 15 markedly improved with chance of ultimate cure; in 3 the result was not known; and in 2 very slight improvement was observed.

The results with the mercury lamp were far inferior to those of the carbon arc lamp light. Of 18 patients treated with the latter, 7 stopped treatment; of the other 11 only 2 were cured, 8 improved, and only slight improvement was seen in one case.

The author further emphasizes the fact that in treating lupus patients in addition to the light baths it is necessary to use local Finsen rays, as only thus can the nodules be made to disappear entirely. With the light rays alone the ulcerations



will heal; the infiltration will recede; the nodules will decrease in size but will not disappear entirely.

Investigations at the Finsen institute at Copenhagen demonstrated the following:

1. That artificial chemical light baths in the form of carbon arc light baths can take the place of high altitude sun baths.

2. That light alone without any climatic factors may heal surgical tuberculosis.

3. That light baths are invaluable in the treatment of lupus vulgaris.

4. That the carbon arc lamp in artificial light baths is far superior to the mercury arc lamp and should always be preferred. L. A. JÜENKE.

**Means, J. H.: Studies of the Basal Metabolism in Disease and Their Importance in Clinical Medicine.** *Boston M. & S. J.*, 1916, clxxiv, 864.

The author has made a study of the basal metabolism of normal individuals and has attempted to formulate simple rules by which a study of basal metabolism may be used as an aid in clinical diagnosis. After a more or less technical discussion of the means of determining the basal metabolism of an individual, he proceeds to the practical application of the method.

The basal metabolism per square meter of body surface for all normal individuals being more or less constant, it is easy to determine whether or not the basal metabolism of patients is above or below normal.

The author's studies were made principally upon obese patients and those suffering from exophthalmic goiter. He reached the following conclusions: Basal metabolism can be studied in a hospital clinic with comparatively inexpensive apparatus. The normal basal metabolism is a fairly constant affair and hence wide variations from it in disease are of interest to the clinician. A marked rise occurs in hyperthyroidism. A marked fall occurs in hypothyroidism. In hyperthyroidism it is probable that basal metabolism is the best index as to the severity of the disease and hence is a quantitative means of following the course and judging the effectiveness of treatment, and it is a valuable aid in differential diagnosis. Enormous grades of obesity are possible in the presence of a normal basal metabolism. When a reduction in metabolism was found in obese subjects there was also clinical evidence of defective internal secretion. A clearer conception of the food requirements in disease is furnished by the basal metabolism than by any other factor. E. FISCHEL.

**Harrower, H. R.: The Diagnosis of the Internal Secretary Disorders; the Detection of the Minor Thyroid Dyscrasias.** *West. M. Times*, 1916, xxxv, 558.

The intimate relation of the thyroid to metabolism, particularly that of proteids, makes it react to that unfortunately all too common etiologic factor in so many disorders — overfeeding — and this is

particularly true of a diet in which meat forms a generous part. Intoxications of all kinds — intestinal, alcoholic, drug, and those due to amœbæ in the mouth or tonsils and to intestinal and other parasites — are not infrequent exciting causes of a breakdown in the thyroid function.

With the foregoing suggestions in mind, coupled with the fundamental physiological fact that the thyroid is as important a factor as any in the detoxicating and immunizing processes of the body, it will be clear that the detection of a minor functional disorder of this gland may be of much more service than merely to direct attention to the measures necessary to reinforce the work of the lagging gland. A much more important thing will have been accomplished if, in addition to this, the underlying causative element is laid bare and steps taken to eradicate it or to nullify its influence. Very, very often the proper adjuvant treatment of thyroid inadequacy — the treatment of its cause as well as its results — is made possible by applying our increased knowledge in the right way.

For these reasons the author rarely employs thyroid medication without some associated treatment. Many a failure in this line of therapeutic effort is due to the omission of the necessary adjunct measures. EDWARD L. CORNELL.

**Senger, W.: Influence of Syphilis upon Surgery.** *Colo. Med.*, 1916, xiii, 213.

The following series of cases influenced the author to perform a Wassermann reaction on all patients. This series represents only cases showing complications not easily explained and in which a Wassermann was made in an attempt to clear the diagnosis.

Total Wassermann tests — 264.

Medical: "3 plus" — 27; "4 plus" — 13.

Surgical: "3 plus" — 21; "4 plus" — 20.

Total probable syphilitics 81, or over 30 per cent.

The surgical cases were complicated with non-union of fractures; sluggish appendiceal abscesses; severe stitch abscesses; gall-bladder infection associated with cirrhosis of the liver; intestinal strictures suggesting cancer, etc.

In syphilitics demanding operation, as, for instance, a crushed arm, the wound behaves just as should be expected, a convalescence usually prolonged beyond the normal time, often with a discharging sinus persisting until antisyphilitic treatment clears the field. EDWARD L. CORNELL.

**Morris, R. T.: Acidosis in Surgery.** *Am. Med.*, 1916, xi, 403.

The author emphasizes the necessity of careful laboratory estimation of the patient prior to the operation and the removal of peripheral sources of irritation, such as eye strain, nasal hypertrophies, hæmorrhoids, etc.

Cases of acidosis include those in which there is an excess in the body of ketone substances, acetone, diacetic acid, and of the oxybutyric acids. Recent-



ly cases with increased ammonia elimination by the kidney have been included.

Crile has shown that emotion leads to a temporary acidosis. Morris states that he is now at work on an unnamed bacterium which he believes is the cause of cases of duodenal ulcer.

The phenolsulphonaphthalein test will save many, while the soda drip will help others.

A brief of a case should be made very much as a lawyer makes a brief before presenting his case to the court.

ISIDORE COHN.

### SERA, VACCINES, AND FERMENTS

**Sewall, H., Mitchell, W. C., and Powell, C.: Immunity Conferred by the Transfer of Immune and of Mixed Immune and Sensitized Serums.** *J. Am. M. Ass.*, 1916, lxvii, 95.

The authors undertook this work in an effort to discover whether the blood serum of guinea pigs rendered immune to considerable intravenous injections of horse serum by a preceding course of nasal instillation of the serum had a different biologic effect from the serum of highly sensitive animals, when injected intraperitoneally into normal guinea pigs. They found that the serum of animals called immune can confer on normal guinea pigs a resistance against a long succession of intravenous injections of the same antigen. It is also probable, they state, that mixtures of immune and sensitive serums in certain proportions give still greater protective effects. Notwithstanding the numerical inadequacy of these experiments made by them, they believe that, taken in connection with the broader research, they justify the following tentative conclusion: A foreign protein injected into a normal animal sets up reactive processes leading to the formation, in this field, of two antibodies having opposite characters, one tending to induce, and the other to avert, the establishment of the anaphylactic state.

Serum containing an excess of the anaphylactic antibody, when transferred to normal animals, renders them, as is well known, passively anaphylactic. Serum containing a sufficient excess of the "protective" antibody, when transferred to normal animals, initiates in them the phenomena of active immunity. Mixtures of the two types of serum seem still more effective, the authors state, in conferring immunity.

The metabolism of the body cells is specifically modified by combination with these antibodies in such a way as to give rise to hypersensitization on the one hand or to active immunity on the other.

If the authors' interpretation of these results is correct it is evident that new definitions must be given for "immune" serums. **GEORGE E. BELBY.**

**Forselius, C.: Experiences with the Vaccine Treatment in Surgical Cases** (Erfahrungen ueber die Vakzinebehandlung chirurgischer Krankheiten). *Tr. XI North. Surg. Cong.*, Goeteborg, 1916, July.

Vaccine therapy used in over 100 cases of cystopyelitis was not always certain in its results. If

large doses are employed, however, it is an adjunct that frequently helps where other methods fail. A decrease in the virulence of the infecting organism often takes place so that internal medicaments, which previously failed, can become of benefit. In various staphylococcus infections (acne, sycosis), the vaccine treatment is of value. In the severe mixed infections of tuberculous suppurations an occasional favorable result is obtained. In isolated instances the treatment was also employed in mixed infections of traumatic lesions and prophylactically at operations on infected areas. In septic joint and bone cases, such as acute osteomyelitis of not too severe character, the treatment with vaccine was justified, and less extensive operations, such as puncture and aspiration of pus, were sufficient. In puerperal sepsis and similar conditions the treatment was of no value. Vaccine therapy deserves more attention than is usually given it as it is a valuable adjunct to most forms of treatment.

**JOHANSEN**, a former associate of Forselius, concurred in the author's opinion. He dwelt at length on 15 cases of septic osteomyelitis treated with vaccine, usually accompanied by puncture or chiseling away of bone. In 50 per cent of these cases a favorable influence was observed from the vaccination so that minor or lesser surgical interference was sufficient. The duration of the disease seemed to be shortened.

**ROVSING** expressed the opinion that the physician who does not understand the vaccine therapy thoroughly will lose many patients who otherwise could be saved. Naturally the autogenous vaccines are to be preferred. It is not to be expected that the invading organisms will be killed thereby (in bacteriuria vaccine therapy is of no value), but the resistance of the organism to the bacteria is increased. The treatment is good in cases of severe infection of the urinary tract. Roving obtained a cure in over 7 per cent of cases of cystopyelonephritis. Good results were also obtained in streptococcal infections of the kidney. He also cited a cure obtained in osteomyelitis.

**EUREN** treated four cases of cystopyelitis with vaccine but received a favorable result in only one.

**DAHLGREN** agreed in the opinion that vaccine therapy is a valuable adjunct and cited examples of successful treatment in cholangitic abscesses of the liver and in a case of transplantation to a severely suppurating surface.

**L. A. JUHNKE.**

### BLOOD

**Moots, G. W.: Observations on Blood-Pressures During Operations.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

The author deplors the lack of system and technique so universally prevalent in most clinics as relates to pressure readings as well as their interpretation. A description of the technique as used by his anesthetist, McKesson, is given. A discussion is given of systolic, diastolic, and pulse-



pressures, as well as pressure-ratio. Much stress is placed upon pressure-ratio, it being defined as the relation of the pulse-pressure to the diastolic pressure, and is obtained by solving the following problem in percentage: What per cent is the pulse-pressure of the diastolic pressure?

From the records of cases of Moots' anæsthetist covering over eight thousand cases of his own and other surgeons, the following conclusions are drawn:

1. The systolic pressure alone is of very slight if any value.

2. The diastolic pressure alone is of much greater value than the systolic alone.

3. The pressure-ratio is of the greatest value and offers the earliest danger signal.

4. There are certain elements in technique which have marked and constant effect upon the pressures:

- a. The psychical or emotional state of the patient.

- b. The position of the patient upon the table, the extreme Trendelenberg being the worst.

- c. Overdosing by the anæsthetist.

- d. The amount of traumatism inflicted by the actual operation, such as cutting and tearing the tissues with scissors, the hands, and other dull instruments; the packing of large gauze pads instead of rubber tissue into the abdominal cavity.

- e. The preservation of fluids in the body up to the hour of the operation, this being absolutely essential if the proper pressures are to be maintained.

**Klotz, O.: Fracture of Arteries.** *J. Med. Research*, 1916, xxxiv, 495.

The author has had an opportunity of studying a great number of specimens showing calcareous degeneration of the media. Three specimens which he studied were obtained from elderly individuals, 60, 69, and 72 years of age. The fractures occurred in the arteries of the lower extremities, twice in the posterior tibial artery, and once in the popliteal, just behind the knee. The appearance was virtually the same in all cases. The annular calcareous deposit was of a dense crystalline character without any evidence of atheroma. At one point the ring was broken, and between the fractured ends was an organizing tissue with fibroblasts and capillaries. Close to each end of the calcareous mass was a closely attached osteoid tissue containing osteoblasts and some calcium salts. This living bone was easily differentiated from the neighboring areas of calcification. The bony spicules were surrounded by many thin capillaries, which frequently lay in indentations in their structure. The fibroblasts appeared to have their processes enter directly into the substance of the newly-formed bone. This vascularized connective tissue formed a considerable and relatively bulky mass, both on the inner and outer surface of the fractured rings. Some of the proliferative reaction entered into the deep portion of the intima. In one specimen the area of response showed the presence of blood pigment, and in applying the iron reaction to the tissue, a positive test

was obtained, not only in the granular deposit of blood pigment, but also within the bony trabeculæ. This hæmorrhage had probably been a secondary occurrence subsequent to the development of the vascular callus, although it is possible that some vascular tissue had been present about the calcareous deposit prior to the fracture.

The author believes that fractures of the arteries may occur through muscular activity, the flexion of joints, and direct trauma imposed upon the vessel walls. The repair of these fractures is brought about by a grade of inflammation in which fibroblasts and blood capillaries take a great part and simulate a reaction comparable to that seen in callus. These processes of repair are not uncommonly accompanied by the formation of bone at the ends of the broken calcareous rings.

GEORGE E. BEILBY.

**Brandt, K.: The Treatment of Thrombosis** (Ueber die Behandlung der Thrombose). *Tr. XI North. Surg. Cong.*, Goeteborg, 1916, July.

During the last 10 years the author has treated 17 cases of thrombosis in the lower extremities following obstetrical and gynecological operations, with elevation of the foot of the bed and with light massage after the fourteenth day. No case of embolus developed and the average time for discharge of the patients was 33 days. Had the elevation of the bed been instituted as soon as the pain in the leg and slight oedema developed many cases would have been checked. No bandages were applied during the treatment, and later also no stockings or supports, as these interfere with the action of the muscles which should propel the blood onward. As soon as the patient is allowed to be up he must walk and not stand; the leg should be elevated at intervals and should be kept elevated during the night.

DAHLGREN stated that he had employed the same treatment in the milder cases but considered it inappropriate in severe bilateral cases.

L. A. JUHNKE.

**Nicolaysen, J.: Embolism in the Arteries** (Embolie in den Arterien). *Tr. XI North. Surg. Cong.*, Goeteborg, 1916, July.

A 52-year-old man had been suffering with sensations of cold in the fingers for an entire winter when he suddenly developed a beginning gangrene of the third finger with severe pains which could not be controlled with morphine. Radial pulse was absent; there was no rigidity; blood-pressure 115; Wassermann reaction was negative. An embolism was suspected at the division of the brachial artery but was not found at the operation. In the forearm, however, a trifle below the middle of the ulnar artery, a knot was found with the pulse obtainable above but not below. A 2 cm. long embolism was removed from this point, and another from the radial at about the same elevation. The vessels were sutured and the pulse became palpable immediately

below the place of suture. The pains ceased; a line of demarcation developed for the gangrenous area and healing resulted. The sphygmograph a year later showed a pulsus tardus in the operated arm but otherwise nothing abnormal.

BORELIUS reported a case of a man, 62 years old, who for a year had had pains in one of his feet, especially severe in the last three weeks. The foot was pale and cold; no definite gangrene set in but symptoms became aggravated. The femoral artery was incised in the canal of Hunter but was found completely closed. It was then opened in the inguinal region and after opening of the vessel slight bleeding occurred but no stream of blood. From the proximal end a thrombus was extracted and the artery was then sutured circularly to the femoral vein, which was patent. The other two openings were closed. In spite of the operation gangrene of the toes set in and amputation had to be resorted to but the patient died a month later. Autopsy showed that a sclerosis of the iliac artery had caused the thrombosis.

HELLSTROM reported a case of a 12-year-old boy with diphtheria, treated with antitoxin, who developed nephritis and later severe abdominal pains and pains in the limbs. The feet soon became cold. At the laparotomy large thrombotic masses were found in both iliac arteries. These were all removed and it was later discovered that thrombosis of the hypogastric artery had also occurred. The patient died twenty hours after the operation. The autopsy showed thrombi in the left auricle; an embolus in the lower part of the aorta; and a fresh thrombus at the site of the division of the common iliac artery.

BAUER showed a prepared aorta obtained from a case of mitral stenosis, from which he had removed an embolus in October, 1913. The patient recovered entirely and was able to perform his daily duties with the exception of a short time a year ago (embolism of the cerebellum). In April, 1916, a break in compensation occurred and the patient died. Autopsy showed extensive changes in the heart, with resultant changes in other organs. The aorta showed no macroscopic changes at the site where the embolism was removed and where the incision had been made.

L. A. JUHNKE.

**Gauss, H.: Studies in Cerebral Fat Embolism, with Reference to the Pathology of Delirium and Coma.** *Arch. Int. Med.*, 1916, xviii, 76.

In a previous study of the tissues of 14 persons who died following fractures complicated by fat embolism, an attempt was made to correlate the amount of fat present in the blood-vessels of the various organs, demonstrable by histologic methods, with the severity of the symptoms noted clinically, and the frequency with which the delirium occurring after fractures was ascribed to alcoholism was emphasized. In 8 of the 14 cases delirium tremens had been diagnosed clinically, although histories of alcoholism had not been definitely established

in all of the cases. The study was made on the bodies coming to necropsy from the Cook County and Presbyterian hospitals, Chicago.

Preparation of the tissues for the purpose of accurate estimation of the fat content is given in detail. Of each piece of tissue, 50 sections were examined; and of these, 5 sections containing average amounts of fat emboli were set aside for comparison. When these were collected they were carefully examined, and the amount of fat in 10 fields of each organ was compared to the amount in 10 fields of the same organ of Case A, which was regarded as containing 100 per cent. Then the percentages of fat emboli in the several organs of each body were averaged and compared to Case A. The result was that the other thirteen bodies were found to contain 5 to 45 per cent of fat emboli in the organs. The fat emboli were most numerous in the lungs. In addition to the presence of fat emboli, there were certain circulatory alterations, as oedema and hæmorrhages, besides fatty changes of some of the organs. Oedema of the brain was observed in 7; fat droplets in the blood stream noted at the time of necropsy in 6; petechial hæmorrhages, also noted at the time of necropsy, in the skin or organs in 9. In the lungs of all the bodies there were large numbers of fat emboli, and in half there were microscopic hæmorrhages. In the heart muscle of 13 bodies there were fat emboli, microscopic hæmorrhages in 12, and fatty degeneration in 6. In the kidneys of all 14 bodies there were fat emboli, fatty degeneration in 13, and microscopic hæmorrhages in 10. In but 6 of the livers were emboli found, while in 12 there was venous engorgement and fatty infiltration, the latter being marked in 7. Fat emboli were also found in the brain, suprarenal, gastric mucosa, testis, and spleen in several instances.

The pathology of delirium and coma, the author states, has not been definitely established. From the data in the literature, there is evidence indicating that they may be caused by a variety of anatomical lesions in addition to those mentioned. Hoch has studied the brain of a man dying of delirium tremens and finds alterations in the pyramidal cells of the cortex cerebri, no mention being made of alterations of fiber tracts or evidence of focal necrosis.

In view of the profound disturbance in the central nervous system produced by the secondary changes of fat embolism, the author believes it is reasonably safe to conclude that these multiple lesions are intimately associated with the clinical manifestations of delirium and coma. GEORGE E. BEILBY.

#### BLOOD AND LYMPH VESSELS

**Bullrich, R. A.: A Sign in the Diagnosis of Aneurisms of the Descending Aorta** (Un signo para el diagnostico de los aneurismas de la aorta descendente). *Rev. Asoc. méd.*, Argent., 1916, xxv, 105.

The sign referred to by Bullrich is that already known of the difference of the arterial pressure in the



wrist and in the ankle, greater in the latter in healthy subjects. The author thinks it remarkable that no one has heretofore thought of establishing precise rules for use in the diagnosis of aneurisms of the descending aorta, by utilizing the modification which this affection produces in the pressure of the subdiaphragmatic arterial system.

The same modifications of pressure may occur, however, without aneurism due to partial obliteration of the tibial artery or by compression of the aorta at the mediastinal level. Likewise the alteration of the normal relation is not found in cases in which an aneurism of the descending aorta exists when this is fusiform or if there are deposited on the internal face of its wall many layers of fibrin, because in such cases the aneurismal dilatation reduces the tension considerably.

It is necessary to recognize all these factors in making a diagnosis. The author gives a number of formulæ for normal and abnormal conditions of the arterial tension.

W. A. BRENNAN.

### POISONS

**Browning, C. H.: Tetanus.** *Brit. J. Surg.*, 1916, iv, 14.

Browning reviews the subject of tetanus, with special reference to the experimental pathology and serum therapy. He summarizes the principal facts and the theoretical considerations to which they give rise as follows:

1. The local muscular spasm of ascending tetanus is due to the action of the toxin on the related segments of the spinal cord. The toxin reaches the cord by passing up the muscular nerves.

2. The general muscular spasm of descending tetanus depends on the diffused action on the nervous system of toxin widely disseminated by the blood and lymph.

3. The spontaneous convulsive seizures are probably of cerebral origin.

In regard to the prophylactic treatment, he states that there is a consensus of opinion that for a great majority of wounds 500 to 1,000 U. S. A. units represent a sufficient dose when injected subcutaneously. He calls attention to the relatively short duration of the immunity and says that a repetition of the subcutaneous dose is indicated at weekly intervals so long as the wound is not definitely healing, and especially if necrotic tissue be still present.

The treatment of declared tetanus is based upon the necessity of neutralizing uncombined toxins in the body fluids and as far as possible removing toxins from combination with the nervous tissue by contact action of the concentrated antitoxin, and preventing purely mechanical causes of death, such as asphyxia and starvation due to muscular spasm.

He feels that the scheme of treatment advocated by Park and Nicoll is rational, i.e., as soon as possible 3,000 to 5,000 U. S. A. units are injected intra-

spinally by means of a lumbar puncture, the serum being diluted with normal salt solution, from 10 to 15 ccm. being introduced, the amount being varied according to the age of the patient and the amount of spinal fluid withdrawn. At the same time 10,000 to 15,000 units are injected intravenously; three or four days later a similar amount will maintain the tissue fluids rich in antitoxins when given subcutaneously for the next five days. The intraspinal injection should be repeated at intervals of twenty-four hours.

The use of magnesium sulphate as advocated by Meltzer and Kocher, also the Bacelli treatment of 2 or 3 per cent carbolic acid subcutaneous injections, are described in detail.

D. L. DESPARD.

### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Porter, M. F.: Primary Treatment of Wounds in Civil Practice.** *Surg., Gynec. & Obst.*, 1916, xxiii, 144.

The most important surgical lesson which the author has gleaned from a large experience covering twenty years is, he says, twofold: (1) A greater respect for the inherent resisting power of the tissues to infection, and (2) less confidence in his ability to cleanse infected wounds. Nature is not a "poor surgeon" provided she receives intelligent aid rather than pernicious interference.

His deductions are as follows: (1) The primary dressing of a wound should be in many cases the final one, and in the majority of cases should not be changed until granulation is well established. (2) Too vigorous use of mechanical and chemical means in an effort to secure clean wounds is frequently harmful. (3) Save in exceptional cases strong antiseptic solutions should give way to solutions of mild strength or normal salt. (4) "Thorough use of the curette" to free a wound of foreign particles is unsurgical. For this purpose dry gauze wipes, forceps, and a stream of water are advised. (5) Search for embedded foreign bodies had better be postponed until Nature has had time to complete her defenses. (6) Barring brain and abdominal injuries, hæmorrhage and shock are synonymous. (7) To delay a necessary operation to allow shock to pass is a mistake. (8) Primary amputations in general should be rarer than they are, and primary amputation of a finger is seldom wise.

Too much zeal in the immediate adjustment and fixation of injured structures with sutures, wires, nails, plates, etc., causes unnecessary loss of lives and limbs. Sutures are a necessary evil, and in lacerated wounds are seldom necessary. Nature will trim a wound of devitalized structures more economically and safely than the surgeon.

The question of tetanus does not enter into the primary treatment of wounds, save those likely to be infected by the tetanus bacillus, i.e., wounds coming in contact with dirt from streets and stables.

### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Dolley, D. H.: The Cytological Analysis of Shock.** *J. Med. Research*, 1916, xxxiv, 305.

Dolley states that alterations in vital conditions affect the functioning of the organism by reason of the irritability of protoplasm. Excitation and depression are the only possibilities of reaction in respect to irritability after any stimulus. There is a unity of mechanism after excitant or after depressant stimuli from the quantitative principle, which governs the reaction to both. Shock represents only variant phases of the effect on the irritable substance by alterations in vital conditions, and is only to be defined in terms of this relationship: the disturbances in the bodily state which result from the concatenated processes of excitation and depression incited by alterations in external or internal vital conditions. Processes of excitation and depression are processes of stimulation in its proper technical sense. For explicitness, the term must be limited by a statement of the genesis. There is, then, the shock of injury, of surgical operation, of hæmorrhage, of vomiting, of heat, of fear, of any alteration in vital conditions which makes itself objectively or subjectively perceptible. Each form of shock represents the changes in the bodily state which result from its peculiar concatenation of processes of stimulation. Collapse is the end phase of shock: the sum total of functional incapacity which is the end-result of processes of excitation and depression, alone or together. **GEORGE E. BEILBY.**

**Hatcher, R. A., and Eggleston, C.: A Contribution to the Pharmacology of Novocaine.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 385.

The authors give the following summary and conclusions of their study of the toxicity of cocaine and novocaine in the Laboratory of Pharmacology at Cornell.

It is still commonly stated that the toxicity of novocaine is about one-sixth to one-tenth that of cocaine, even though several observers have called attention to the dependence of the toxicity of novocaine on the mode of administration, and especially on the rapidity with which it enters the circulation.

The toxicity of novocaine is greatest when a concentrated solution is injected rapidly into the vein, in which case a dose of 40 mg. per kilo is fatal to the cat and rabbit, and probably to other animals, though much smaller doses cause severe, and even threatening, symptoms. Very much larger doses may be injected slowly into the vein or subcutaneously without causing more than temporary disturbances.

Cocaine shows an analogous though slighter variation in toxicity dependent on the mode of administration.

The subcutaneous injection of a mixture of novocaine and epinephrin results in greatly delayed

absorption and consequently diminished toxicity of the novocaine for the cat. When such a mixture is injected intravenously there is a synergistic constrictor action on the vessels, with an antagonistic effect on toxicity probably due to the action of epinephrin on the heart.

The toxicity of novocaine is increased, but in a variable degree, by the previous administration of hydrated chloral which depresses the respiratory center.

The extremes of toxicity of novocaine shown when it is injected rapidly into the vein of a chloralized cat (10 mg. per kilogram, fatal) and when administered slowly to a normal cat (408 mg. per kilogram with only temporary disturbance) suggest a possible explanation of the accidents occasionally seen when small doses of novocaine are used clinically.

Novocaine leaves the blood stream rapidly, being fixed or destroyed in the liver, the weight of evidence pointing to its destruction in that organ.

Less than three per cent (if any) of a large intravenous dose is excreted unchanged in the urine of a cat within a period of two to three hours.

One is not justified in speaking of the ratio of toxicity for cocaine and novocaine without reference to the mode and rate of administration, the concentration of the solution used and the species of animal employed.

Novocaine in concentrated solution may be fatal in smaller doses than cocaine if the latter passes slowly into the circulation and the former rapidly. Nevertheless there is no reason to doubt that novocaine is safer than cocaine when used properly.

The proper clinical use of novocaine requires attention to the condition of the heart and respiration, and the avoidance of its rapid entrance into the circulation.

The combination of epinephrin with novocaine certainly delays absorption from the subcutaneous tissues, and probably enhances the local anæsthetic action of the latter drug.

The liver removes novocaine from the circulating blood rapidly and this almost certainly accounts for the prompt return to normal following the rapid intravenous injection of a nearly fatal dose. Little or none of the drug is excreted unchanged in the urine of the cat.

**W. M. BOOTHBY.**

**Butler, E. E.: The Organic Depression of the Nerve-Cell Produced by Prolonged Ether Anæsthesia.** *J. Med. Research*, 1916, xxxiv, 325.

Changes in the nerve-cells produced by morphine and heat stimulation, as well as by other depressants, have already been studied and therefore the author has endeavored to determine in the present experiments the effects of the anæsthetics. The experiments on morphine and heat stimulation gave anatomical proof for the nerve-cell of the correctness of Verworn's physiological deductions; namely, that "the same stimuli which with slight intensity or short duration produce excitation, with increased



intensity or long duration can produce entirely the opposite effect, namely, depression." The author notes that it would be expected from the physiological action of the anæsthetics that they would act in a similar way.

The present experimental work has been devoted to the anatomical changes produced in the Purkinje cell, one of the most highly differentiated types of nerve-cells. The experiments were carried out on dogs.

From the author's summary of the literature it appears that anæsthetics produce certain changes in the nerve-cells. The changes after the anæsthesias of short duration appear to be only the changes of excitation, while those of longer or repeated anæsthesia can be identified as depression. The investigators noted that there were no marked changes up to one and one-half hours, but that they made their appearance between that time and four hours, and that the changes produced depended upon the duration of the anæsthesia. These two statements agree with the results obtained in Butler's investigation.

Ether anæsthesia produces certain definite anatomical changes in nerve-cells of dogs. The changes are first those of mild activity, and later there are superimposed changes of depression, depending in severity upon the duration of the anæsthesia. The changes of depression first make their appearance microscopically in about two hours. Anæsthesia lasting two to six hours produces a moderate depression, up to eight hours a marked depression, and more than eight hours a profound depression with the beginning of necrobiosis.

The severity of the anatomical changes in the nerve-cell appears to be in direct relation to the length of the anæsthesia, allowance being made for individual variations.

The changes vary in degree in animals of the same species, kept under the same form of anæsthesia for the same length of time.

An anæsthesia of several hours' duration for several successive days produces almost the same degree of depression in the nerve-cells as a continuous one of the same number of hours.

Animals which are easily kept anæsthetized show more marked anatomical changes in the nerve-cells than animals that are kept under the anæsthesia with difficulty, when the time length and the kind of anæsthesia are the same.

A state of collapse results from ether anæsthesia of eight or more hours' duration. This state of collapse is coincident with profound depression, and is considered to represent the end constitutional effect of a diffusely acting depressant.

GEORGE E. BEILBY.

**Bull, C. G.: Further Observations on the Agglutination of Bacteria in Vivo.** *J. Exp. Med.*, 1916, xxiv, 25.

In a previous paper the author reported the occurrence and the apparent significance of the agglutina-

tion of bacteria within the circulation of infected animals. The points brought out were briefly as follows: Virulent pneumococci, dysentery bacilli of the Shiga type, and virulent influenza bacilli do not agglutinate when injected into the circulation of normal rabbits; while typhoid bacilli, dysentery bacilli of the Flexner group, and non-virulent influenza bacilli are agglutinated immediately after entering the circulation of these animals. On the other hand, an intravenous injection of a small quantity of specific immune sera caused an instantaneous agglutination of pneumococci and Shiga dysentery bacilli in the circulation of infected rabbits. The bacterial clumps accumulated in the organs where they were phagocyted. It was suggested at that time that the power of the blood to cause agglutination determines, apparently, in large measure, whether the bacteria are to be promptly removed from the circulation and septicæmia avoided or whether they are to remain there and produce a blood infection.

The authors made further observations in this connection, and the results of these experiments corroborate the occurrence and amplify the significance of the agglutination of bacteria within the circulation of infected or inoculated animals. It has been pointed out by the author that an inverse ratio seemed to exist between the power to produce septicæmia and the degree of the agglutination of the infecting bacteria in the circulation of the host. This conclusion was drawn from observations made with a few bacteria and with one animal species, the rabbit. The observations described here have a double import in that a large number of bacteria have been studied and the observations have been extended to other animals.

Bull states that it is not his intention to urge that agglutinations and opsonins are all there is to the immunity forces, but he emphasizes the fact that they are operative within the circulation and organs of infected animals where they seem to play a decisive part in many instances.

From his study, Bull makes the following summary:

Pneumococci, dysentery bacilli of the Shiga type, and bacillus mucosus capsulatus are agglutinated immediately when injected into the circulation of actively immunized rabbits.

Staphylococcus aureus and albus, colon bacilli, meningococci, gonococci, and non-virulent pneumococci agglutinate in the circulation of normal animals.

Bouillon cultures of bacillus avisepticus are highly toxic for both rabbits and dogs. The fresh sera of these animals have no bactericidal action upon the bacteria. Dog serum opsonized the bacilli *in vitro*, and they are agglutinated and opsonized in the circulation and organs of normal dogs. On the other hand, none of this occurs in connection with normal rabbits. A very small quantity of culture produces a fatal septicæmia in rabbits, but a sub-toxic dose is without effect in dogs.

The degree of agglutination and opsonization of

bacteria within the animal body is inversely parallel to the infectiousness of the bacteria for the host.

GEORGE E. BEILBY.

**Towles, C.: The Lethal Dose of Arsenic for Splenectomized Mice.** *J. Pharmacol. & Exp. Therap.*, 1916, viii, 465.

Since splenectomy is frequently performed as a treatment for severe anæmia, and since in many cases the condition of the patient subsequently requires other therapy, either blood-transfusion or the administration of arsenic, it seemed worth while to the authors to determine, by animal experimentation, whether the removal of the spleen influences the lethal dose of the poison.

The first series of mice that were used in Towles' experiments received arsenous acid in 1 per cent solution neutralized with potassium bicarbonate; that is, Fowler's solution without the coloring and flavoring substance. This special preparation was diluted 1:100 with distilled water so that the animals received the neutralized arsenous acid in a dilution of 1:1000. In accordance with the findings of Hunt that the reaction of the body tissues to poisons is influenced markedly by the diet, the animals used for this work were kept at least one week, and usually longer than ten days, upon a fixed diet of bread and water before the arsenic was injected. The bread was always obtained from the hospital kitchen and was the same throughout the experiment.

Some preliminary injections were made with sodium cacodylate, but this substance had to be abandoned because of its lack of toxicity; 1 mg. per gram mouse was used without observable result. After the lethal dose of the prepared Fowler's solution was determined the following series of six normal and five splenectomized mice were injected. No animal was injected a second time, the diet was carefully supervised and the mice were kept in jars filled with hay; the injection was subcutaneous and usually made in the back.

Following this result potassium arsenite was used for a second series of subcutaneous injections. The mice for this series were kept in cotton waste instead of in hay as being less likely to interfere with the constancy of the diet. Twelve normal and six splenectomized mice were used. The potassium arsenite was made up into solution each time, 0.1 gram to 100 ccm. of distilled water.

The first series of mice showed a clear cut difference of result after the administration of the same amount of arsenic and suggested that splenectomized mice were more resistant to arsenic poisoning than normal ones. The second series, however, made it plain that the difference, if any exists, must be within the limits of normal individual variation. The upper limit of endurance of the normal mice was above 0.014 mg. of potassium arsenite per gram mouse and the lower limit of the lethal dose for splenectomized mice is below 0.0145 mg. of potassium arsenite per gram mouse. Two guinea pigs, one of which had been splenectomized on the fourth

of December, received a subcutaneous injection of potassium arsenite in a 1:100 dilution. Each received 0.0088 mg. per gram of body weight. The normal animal weighed 532 grams and the splenectomized one weighed 599 grams. Both guinea pigs were very sick for 48 hours after which time the splenectomized one became better and by evening of the second day was entirely well; the normal one died about 54 hours after injection.

It may be concluded from these experiments that the body resistance to arsenic is not reduced by removing the spleen.

GEORGE E. BEILBY.

## RADIOLOGY

**Schmitz, H.: An Additional Contribution to the Therapeutic Value of Radium in Pelvic Cancers.** *Surg., Gynec. & Obst.*, 1916, xxiii, 191.

The author reviews 80 cases of cancer of the pelvic organs treated with radium from April, 1914, to April, 1916.

A description of the technique employed is given. The use of the roentgen ray by the multiple-field cross-fire method of Gauss in conjunction with radium is advocated; surgical procedures facilitating the application of radium are also discussed.

The clinical results differ, depending on the organ involved, whether uterus, vagina, or rectum, and on the stage of the disease, whether operable, inoperable, or recurrent. The percentage of clinical cures, i.e., objectively and subjectively and not anatomically is as follows: 31.1 per cent, or 14 cases, in 45 inoperable carcinomata; 25.8 per cent, or 5 cases, in 19 recurrent cancers.

The conclusions are as follows:

1. The therapeutic action of radium depends upon a correct technique based on a careful physical examination of the patient.
2. The result of radium therapy in inoperable and recurrent cancers surpasses those of any other known therapeutic agent.
3. The prophylactic use of radium in inoperable cancers increases the percentage of operability and probably the efficacy of the operative procedure.

Six tables reviewing all cases treated and references are given.

**Heyerdahl, P. A.: Several Cases of Actinomycosis Cured with Radium** (Einige Faelle von Actinomycose geheilt mit Radium). *Tr. XI North. Surg. Cong.*, 1916, Goeteborg, July.

X-ray treatment especially combined with potassium iodide has been employed in the treatment of actinomycosis but radium has been tried but little. The author formerly reported a case which was cured with radium after all other methods had failed. He has since had five other cases in which a prompt cure resulted. However, one case of actinomycosis of the breast died of the disease four months afterward.

ROSVING mentioned a few cases treated by him with the X-ray. In one case a beneficial action was



noted; in another case, which is still under treatment, an extensive spreading of the disease resulted so that the X-ray treatment had to be discontinued. Numerous small abscesses developed which had to be incised.

VON BERGEN has treated 8 to 10 cases of actinomycosis with radium since 1913, and later treated them with the X-rays. He also observed at the beginning of the treatment a spreading of the trouble with abscess formation but later healing set in. Only old neglected cases (lungs) were not influenced, all others were improved.

KAARSBERG cited a previously reported case of extensive actinomycosis of the abdomen cured with X-rays and potassium iodide, which has remained well one and one-half years. L. A. JUHNKE.

**Delavan, D. B.: Further Progress in the Use of Radium in the Field of Laryngology.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

Decided advances have been made during the past year in our knowledge of the application of radium in diseases of the upper air passages, while the number of the conditions in which it is found effective is being steadily increased.

A condition in which radium has no rival is in the reduction of lymphoid tumor cases, as found in tumors of the tongue, called hæmolymphangioma.

The treatment by radium of papillomata of the larynx, as with warty growths in general in other parts of the body, is being attended with ever increasing success.

Leucoplacia of the tongue, Abbe believes, is as capable of cure by radium within the mouth as is the skin hyperkeratosis. In the mouth, however, the duration and the method of application require more judgement and skill to attain good results. The treatment is associated with transient painful irritation, but this seems essential to success.

Chronic abrasions and fissures of the lip are curable by radium.

New-growths of non-malignant type are receiving an increasing amount of attention, with excellent results.

Abbe has shown a case of myeloid tumor of the lower jaw completely cured.

Tumors of the larynx of various kinds have been caused to disappear by radium treatment, with complete return of the singing voice.

In the field of nasopharyngeal fibroma the use of radium is most encouraging, particularly so in view of its success in the treatment of fibromata of the uterus.

Two cases of sphenoid carcinoma, observed by the author, are worthy of notice. Both originated in the left side of the throat, close to the wall of the larynx, probably extralaryngeal. Both were seen late, long after operation would have been possible. Both patients were men in the early fifties, hitherto in perfect health, active, vigorous, and of good antecedents. When first seen the disease in both had invaded the interior of the larynx, the left

lateral wall of the pharynx, the pyriform sinus, the tonsil, and the base of the tongue. Ulcerations were present in both, and there was marked aphonia and dysphagia. Both were treated at the same institution, exposed to large doses of radium, and in both the results were materially the same. The first effect locally was an almost immediate control of the secretions of the throat. From having been abundant and foetid, they promptly ceased. Following this the areas of ulceration rapidly diminished in extent, and in the less severe of the two cases disappeared, while in the other case they seemed to do so. The swellings, which had appeared over extensive areas of the affected parts, decreased markedly, and the infiltrated tissues were reduced in size, became soft to the touch and more natural in appearance. Meanwhile the voice became clearer and deglutition improved so that both patients were able to swallow without pain and so were able to largely increase the variety of their food. The general improvement was remarkable. Digestion became normal, and sleep more prolonged and restful. Strength increased steadily, and there was an almost normal condition of good spirits. One patient, a physician, has been able to resume office practice and operative work for a period of over two months. Both have agreed that if the further progress of the disease should be entirely unfavorable, the benefit gained in the relief from suffering and the added comfort afforded have well repaid them for any inconvenience which the radium caused, whether from burns of the skin or from any other result.

Already results worthy of profound consideration have been obtained. Far from being discouraged, there is every reason why persistent and continued effort should be made to finally solve the existing problems and give to the world a successful cure.

OTTO M. ROTT.

**Forsell, G.: Value of Roentgenology in the Treatment of Bone and Joint Tuberculosis** (Die Bedeutung der Roentgenuntersuchung fuer die Diagnose der Knochen und Gelenktuberkulose). *Tr. XI North. Surg. Cong.*, Goeteborg, 1916, July.

By means of a series of X-ray pictures Forsell demonstrated the pathologic changes characteristic of bone and joint tuberculosis. A diffuse atrophy which does not destroy the structure but makes the bone more transparent is peculiar to tuberculosis. A spotted appearance may also occur in tuberculosis, but is not particularly characteristic as it is seen as frequently in osteomyelitis. The presence of a large focus in conjunction with atrophy points to tuberculosis, as sarcomata do not produce atrophy. Characteristic of tuberculosis is also the thinning out of the cartilage without extensive changes in the bone structure. In tuberculosis of the wrist and foot the bones will mass together more than in tumors where a separation is more common. A negative finding does not exclude tuberculosis and good X-ray pictures, properly interpreted in con-



junction with the case history, are always extremely valuable in the diagnosis. He also demonstrated pictures of spondylitis in which the X-ray showed foci which could not be demonstrated clinically; also pictures of Koehler's and of Calve-Perthe's disease.

IPSEN compared the clinical findings at operation with the X-ray findings in 158 operated cases of bone and joint tuberculosis and came to the conclusion that much greater destructive processes were found at operation than the pictures showed. It is especially true that in the larger bones and joints foci — primary or secondary — are frequently found which were not seen on the X-ray plate. On the other hand, it is usually true that the changes demonstrated by the X-ray are in reality there; the destruction, however, is frequently much greater than suspected from the plate, as the general transparency of the affected parts makes it difficult to determine the extent of the destruction. The most positive findings are obtained in lesions of the smaller bones — hand and foot.

In the discussion VON BERGEN stated that he had found good correspondence between the X-ray pictures and the clinical findings.

WALDENSTROM showed pictures of early recognized cases, and cited examples of the significance of X-ray pictures in determining whether a case was tuberculosis or not, especially in hip disease.

HAGLUND, contrary to Forsell, stated his belief that Koehler's disease is not a developmental anomaly but a disease of traumatic origin.

JENSEN emphasized the importance of repeated X-ray examinations and a comparison of the plate of the diseased side with that of the healthy side.

SUNDT attributes only secondary importance to the X-ray, as in his opinion it frequently fails in beginning cases, especially in hip-disease, and in advanced cases does not indicate whether the destruction was due to tuberculosis or to chronic osteomyelitis. The operation also frequently shows a much greater destruction than was suspected from the X-ray plate. In hip-disease clinical symptoms are positive; whereas X-ray pictures (and tuberculin) produce findings more or less negative. The X-ray picture is most dependable where it shows that the disease is not tuberculosis but other lesions, as coxa vara or Calve-Perthe's disease, or something else. Contrary to Perthe, Schwarz, and others, the author has in the latter disease found the lighter areas directly under the epiphyseal cartilage especially in the outer and upper corner of the neck, showing that the disease is one of the neck as well as of the head. The Calve-Perthe disease is much more common than is generally supposed. Among the author's material at the coast hospital at Fredriksvärn the relation of tuberculous coxitis to Calve-Perthe's disease was as 3 to 1. The X-ray examination of adults, who during childhood have had hip-disease, very frequently permits the certain exclusion of tuberculosis — in one case even 19 years afterward.

In closing the discussion FORSELL maintained that abnormalities were always present in the X-ray findings of clinically diagnosed cases, and that tuberculous changes in bone produce typical X-ray pictures because the pathologic changes are typical.

IPSEN, in his closing remarks, maintained that he had seen cases in which nothing abnormal could be demonstrated in the pictures of early cases, and he emphasized that the macroscopic changes caused by tuberculosis in bone are not always characteristic and that pictures do not always show specific changes.

L. A. JUHNKE.

**Ernst, N. P.: Treatment of Surgical Tuberculosis with the General Carbon Arc Light Bath** (Behandlung chirurgischer Tuberkulose mit generellem Kohlebogenlichtbad). *Tr. XI North. Surg. Cong.*, 1916, Goeteborg, July.

The treatment has been employed since the fall of 1913. The source of light was the carbon arc light of 20 to 75 amperes. Only in 3 cases of spina ventosa in children was the quartz lamp employed. The treatment was commenced with exposures lasting one-half hour, the time being gradually increased until exposures of two and one-half hours every other day were given. The entire body was subjected to the rays. A tabulated review of the results of 100 treated cases having 150 surgical tuberculous lesions is given. Lupus is not included in the list although many cases were found in the lot.

Of 29 patients with ulcerating and fistulous lymphomata 26 were cured; in the other 3 the ulceration and fistula disappeared and the glandular swelling decreased to a minimum. All 26 were observed from two months to two years; 4 had recurrences. Four patients with fistulae or ulcerations after laparotomy for tuberculous peritonitis remained well. Ten patients with subcutaneous tuberculosis were all cured and some rather quickly. All have been followed up and are well, some of them six months after the termination of the treatment. Twenty-six cases of spina ventosa in 17 patients were treated. Of these 11 were closed and uncomplicated; 15 were complicated, some old cases which were refractive to operation and X-ray treatment. All 26 were cured. Twenty-five were controlled, many for one-half year after the termination of the treatment and all were free from recurrences. Four cases of wrist-joint tuberculosis (one with fistula) were healed, with normal movement of the joint. All 4 were controlled and are free from recurrence; 3 of them for a period of over 10 months after termination of the treatment. Of 5 cases of closed elbow-joint tuberculosis 3 healed with normal mobility of the joint, one with partial mobility. Of 4 cases of complicated tuberculosis of the elbow-joint 3 were cured with normal mobility and one with partial mobility. All 9 patients have been kept under control; 5 for more than a year after the termination of the treatment. Only in one fistulous case did a small conges-



tion abscess develop, but this healed later. One uncomplicated case of foot tuberculosis was cured but the child later developed spondylitis. Of 8 complicated cases 5 were cured with good or normal mobility; 2 were improved; and in one case death occurred on account of sepsis. The 6 cured cases were observed for three to eighteen months after the suspension of treatment and were free from recurrence.

Three uncomplicated cases of knee-joint tuberculosis were cured with normal mobility of the joint and were free from recurrence for 6, 6, and 12 months respectively. Four patients with complications (2 after resection) were cured and remained well from six to twenty months after termination of the treatment. Of 14 cases of osteitis with fistulae 11 recovered; 1 is almost well; and 2 are improved or unchanged. Of these 10 have been followed up and 9 have remained well — 6 for more than a year. Many of these patients were ambulatory patients and lived for the most part in very poorly furnished hovels and remained at work.

In the discussion, HEYERDAHL stated that he had employed the carbon arc lamp light since February, 1913, principally in tuberculosis of the glands and of the soft parts. The results were good but he considers the treatment only an adjunct to treatment with sunlight.

HOLMBOE employs the treatment with artificial light in winter and in the summer employs the sunlight.

REYN protested against calling the carbon arc light bath only an adjunct to other forms of treatment. He believes that in cities it can replace the sunlight treatment entirely, with the added advantage that the patient can continue with his occupation.

L. A. JUHNKE.

### MILITARY SURGERY

**Dermer: Clinical Study on the Dressing of Wounds Based on 943 Observations** (Etude clinique sur le pansement des plaies basée sur 943 observations). *Bull. et mém. Soc. de chir., de Par.*, 1916, xlii, 1723.

Dermer bases his report of the effects of different antiseptics on ordinary wounds upon his observations in 943 hospital cases.

He studied two points particularly: the duration of hospitalization and the number of dressings used from the occurrence of the accident up to the time of recovery.

All kinds of injuries both superficial and deep of different regions were taken into account. In the series of 943 cases, 101 were treated with oxygenated water; 175 with potassium permanganate; 75 with ether; 135 with Dakin's liquid; and 457 with magnesium chloride.

With the exception of the difference in the antiseptic used all other procedures were the same in all cases. The results obtained by Dermer bring out two points clearly: (1) that Dakin's liquid generally has given better results than oxygenated water,

permanganate, or ether; and (2) that the duration of hospitalization in the case of injuries dressed with chloride of magnesium has in general been only about one-half as long as those treated with Dakin's fluid.

W. A. BRENNAN.

**Leroy: Results Obtained by the Early and Systematic Disinfection of War Wounds** (Résultats obtenus par la désinfection précoce et systématique des plaies de guerre). *Presse méd.*, 1916, p. 324.

Leroy who formerly used the expectant treatment has now adopted the method of total and minute exploration of the trajectory of the projectile; extraction of foreign substances; excision of damaged tissue; iodide disinfection followed by primary or secondary reunion of the wound.

The results have been very convincing and are even better where the patient is treated earlier. Leroy has so treated 298 cases, 175 of which were injuries of the soft parts, all showing excellent results. Early disinfection of articular wounds gave brilliant results. Of 18 such, 13 have recovered with *restitutio ad integrum* of their articulation, and although a few had to undergo resection, there were no deaths nor need of amputation.

In 21 cases of fracture 2 were amputated on account of excessive osseous lesions. All others have consolidated or are favorably progressing toward consolidation. The result of wide excision of muscle in cases of gaseous gangrene is sometimes astonishing. Of 35 cases of massive or diffuse gaseous gangrene only 5 were lost. Ambulance mortality has been diminished more than half since this procedure has been systematically employed.

W. A. BRENNAN.

**Isnardi, L.: Treatment of Septic War Wounds by Abstention; Clinical Observations on 2,300 Wounded** (Cura delle ferite settiche di guerra coll' astensionismo; osservazioni cliniche sopra 2,300 feriti). *Gior. d. r. Accad. di med. di Torino*, 1916, lxxix, 3.

The author, basing his opinions on the accounts published by other surgeons in the theaters of war and upon his own experiences as Chief Surgeon in the large military hospitals at Turin and Vercelli, is a strong advocate of abstention. Older surgeons were sometimes interventionists and sometimes abstentionists but they could not boast of success, because sepsis ruined their hospital results.

Antisepsis revolutionized matters, but the resulting facts have not fulfilled expectations. In the war of 1870, resection of limbs and articulations, practiced by the Germans on a large scale as preventive measures, gave disastrous results. Even after the discovery of the tubercle bacillus German surgeons believed it could be destroyed by the bistoury, but there were numerous victims who developed Pott's disease and coxitis. Today 90 per cent of such cases are cured after simple immobilization.

The discovery of phagocytosis gave renewed hope, inasmuch as treacherous antisepsis could be dis-

pensed with. The basal motive of antiseptics was that it was easy to prevent sepsis, but impossible to conquer it with the means available. Phagocytosis, on the other hand, aimed at the cure of infected wounds, particularly the infections due to surgical manipulations. The good results obtained by aseptic procedures showed quite clearly that the hand of the surgeon is the most conspicuous source of infection.

Abstinence as practiced in recent wars shows that intervention is the cause of the worst complications. Primary infections are very rare. Phagocytosis alone assures the recovery of 99 per cent of wounds, as shown clinically. It is only in the one case, where Nature clearly shows itself impotent, that it is permissible to intervene with a sanguinary operation. To intervene in the other 99 is to dry up the source of phagocytosis and to deprive the organism of a safe natural agent and to substitute an artificial remedy; in the case of robust wounded it is like the substitution of artificial feeding for the milk of a young and strong mother.

The author's rules for the treatment of wounded are as follows:

1. No immediate interference. When the injury has reached the preseptic or septic state, elevation of the parts, immobilization of the various segments of the limb or of all the limb whether it is the bones, articulations, or muscles which are injured, medication to relieve pain, etc.
2. Radiologic examination; no useless soundings — osseous fragments should be ignored.
3. To delay making any openings and then to make such very small.
4. The frequent secondary hæmorrhages (exclusive of those of the larger vessels) should be treated by medication or simple compression, elevation, and immobilization.
5. Abolition of drainage and dressings or reducing their use in exceptional cases to a very short period, and substituting for them cannulæ of silver nitrate with immobilization of the muscles and external drains of kaolin or carbon powder.
6. If there is a recrudescence of sepsis, a re-infection of wounds which seemed to be recovering with formation of phlegmons, etc., recommence in the same way with rest, elevation, immobilization, gauze, and impermeable dressings.
7. The greatest care should be observed in exact medication of wounds and in the preservation and asepsis of the skin around them, the rational toilette of which must always be looked to before application of gauze. Avoid bringing the finger in contact with the skin in the vicinity of the wound.

W. A. BRENNAN.

**Morison, R.: The Treatment of Infected Suppurating War Wounds.** *Lancet*, Lond., 1916, cxi, 268.

The method advocated by the author is as follows: The field and wound are first carefully cleansed with 1:20 carbolic lotion. The wound is then filled with a paste made as follows: bismuth subnitrate

1 ounce; iodoform 2 ounces; sufficient paraffin liquid to make a thick paste. The wound is then covered with sterile gauze and the superficial dressing only is changed as often as necessary according to the amount of the discharge. The results have been uniformly satisfactory.

J. H. SKILES.

**Wright, A.E.: Treatment of Infected Wounds by Physiological Methods.** *Brit. M. J.*, 1916, i, 793.

The treatment of septic war wounds divides itself naturally into three therapeutic procedures: (1) The aim is to promote the destruction of the microbes deep in the tissues, re-establish normal conditions in the tissues and prevent spreading of the infection. (2) When the deep infection has been exterminated the surface infection must be dealt with. (3) The processes of repair are promoted, tissues brought together, and the denuded surfaces covered.

The ordinary antiseptic combines with every kind of albumin, thereby losing its bactericidal and penetrating power. In the customary treatment of wounds, drainage is entirely inadequate. In tissues of normal density nothing like adequate effusion may be obtained, the lymph flow being here rapidly arrested by clotting and desiccation. No steps are taken to disperse infiltration or accelerate the separation of the sloughs or bring antibacterial lymph or phagocytes to the seat of infection. Lastly, in the ordinary treatment of septic wounds not nearly enough care is taken to prevent those active and passive movements which lead to the mechanical impulsion of microbes along the lymphatics and to auto-inoculations.

Saline dressings supply a means for evoking, in the infected wound, certain requisite physiological reactions. By their aid we can, while inhibiting bacterial growth, drain the tissues, resolve infiltration, and promote the separation of the sloughs, besides giving other assistance.

As to the physical and physiological action of concentrated salt solutions the following facts are noted: (1) A concentrated salt solution will attract water which will carry out with it the whole of the protein substance which it holds in solution. This means that a hypertonic salt solution applied to tissues lying bare in the wound, will operate as a lymphagogue, drawing out from the infected tissues lymph which has spent all its antibacterial energy and drawing into the tissues from the blood stream lymph inimical to microbic growth. (2) Brought into direct application upon leucocytes a hypertonic solution will disintegrate them, setting free trypsin. (3) It will inhibit the action of the tryptic ferment. (4) It will inhibit coagulation. (5) It will inhibit leucocytic emigration. (6) It will inhibit microbic growth.

Physiological sodium chloride exerts a positive chemiotactic effect on white blood corpuscles. In moderately dilute solution salt does not interfere with the activity of trypsin, nor does it inhibit



blood or lymph coagulation, phagocytosis, or microbic growth.

By the time the patient reaches the clearing station his wound will generally have assumed the character of a lymph-bound, infiltrated, and sloughing wound. By free incision and the application of hypertonic saline solution a fresh supply of lymph will be drawn into the wound and conditions established in the depths of the wound favorable to the extermination of the microbic infection and in the cavity of the wound conditions which will restore microbic growth. As the salt solution becomes more dilute the tryptic ferment comes into action and goes about its work of cleansing digestion. At the same time leucocytes emigrate into the wound and the discharge begins to assume a purulent character.

In cases of gas gangrene, streptococcic cellulitis, infection of joints, continuous lymph-lavage is acquired and necessitates the continuous use of hypertonic salt solution. So also in cases which are threatened with secondary hæmorrhage and it is very important to prevent any tryptic action.

The author goes into detail as to the method of making proper solutions, and the method of applying hypertonic salt solution so that it may produce an adequate lymphagocic action, and afterwards provide opportunity for digestive cleansing of the wound. Several methods of supplying hypertonic salt solution are described. The author does not favor the use of small sacs containing sodium chloride.

As regards the external covering to go over the wet salt dressings, the author favors the use of an impervious covering to prevent the drying up of the dressing and the subsequent deposition of sodium chloride in the dressings.

A septic wound requires to be dressed under two quite different conditions: (1) it requires redressing as soon as tryptic ferment is set free in the cavity of the wound; (2) again, every septic wound should be redressed as soon as it is lymph-bound.

The usual method of showing preference in the dressing of wounds where the dressings have become saturated with discharges the author believes is wrong. A gravely wounded man may have unsoiled dressings. It should be definitely determined that the wound is not lymph-bound and the poisons being absorbed into the system.

In order to prevent auto-inoculations and a dispersal of septic infection along the lymphatic channels great care should be taken in the handling of infected extremities and in the moving of patients so as to prevent dissemination of infection. Especially is this true in cases of compound fractures when too often the assistant is allowed to use the lower part of the extremity as a lever to support the limb.

A moist dressing with an impervious covering is usually the best method for caring for wounds in preparation for long journeys during which they cannot be kept under close observation.

The method of correcting certain undesirable

after-effects which may supervene upon the ill-considered or too long continued use of hypertonic salt solutions; and indications as to when the hypertonic salt solution ought to be discarded in favor of a weaker solution is discussed and several conditions are described in great detail which may arise following too prolonged use of hypertonic sodium chloride.

Physiological salt solution is used in the destruction of the surface infection.

As to the final stages in the treatment of the wound, secondary suture is always to be desired if the wound can be made sufficiently clean. Careful observation is necessary for at least a week afterward.

J. H. SKILES.

**Gordon, W.: The Reduction of Disabilities from Wounds in War.** *Bristol Med.-Chir. J.*, 1916, xxxiv, 1.

The early treatment of disabilities allows the early return of the soldier to the front and relieves the state of the burden of pensioning a disabled individual. From the standpoint of the soldier it ensures greater happiness for him in years to come.

The treatment has been carried on extensively in France and consists essentially of:

1. The application of heat, either moist or dry, which greatly facilitates the thorough course of massage, manipulation, mechanical treatment, and electricity.

2. A re-education of the effected muscles by exercises and training, the results being checked by careful measurement of the initial defect and the ultimate gain.

This course of treatment has given astounding results and it is claimed will effect a saving to France of about 50,000,000 francs per year.

J. H. SKILES.

#### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

**Marvel, E.: The Surgeon's Responsibility to the Economics of the Hospital.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

A mutual dependence exists between the hospital and the surgeon. This relation imposes upon the surgeon the duty of guardianship for, and a responsible duty to, the institution. He becomes partly responsible for the waste and abuse of its resources. He is directly responsible for loss of service and embarrassment to the organization when late for operation, dressings, or other appointments; the waste in using unnecessary or unduly expensive supplies; and for misuse of funds occasioned by encouraging expenditures for construction and equipment which do not give commensurate beneficial returns. A staff surgeon must share responsibility for the neglect to utilize opportunities, which if taken advantage of would benefit the hospital. It is his duty to inspire enthusiasm in attendants; maintain a congenial atmosphere for

the patients; and to further improvements in service. It is his privilege and duty to teach the patient better care for self, and to give him instruction in regard to the prevention of recurrence of disease or injury. His opportunities for service to conserve the institution's interests are many and his responsibility proportionate.

**Gilbreth, F. B.: Motion Study in Surgery.** *Canad. J. M. & S.*, 1916, xl, 22.

The standardization of hospitals is now gradually being recognized as desirable and necessary. Such standardization must be based on measurement which, so far as the manual processes of the surgical clinic are concerned, consists mainly of motion study.

Motion study concerns itself with the investigation of activity and rest and with an attempt to accomplish the most of a given quality of output with the least expenditure of time, energy, and fatigue. The three main divisions of motion study pertain to: (1) the worker; (2) his equipment, surroundings, and tools; (3) his motions.

Data relating to motion study in any one kind of work are usable in every other kind of effort and the surgeon furnishes in every respect the ideal example to be motion-studied for the four following reasons:

1. As a worker, in that he is the most interesting of all mechanics, the motions that he makes being the most delicate, the most interesting, and the most far-reaching in their importance.

2. In his equipment, surroundings, and tools. Because of the importance of his work, these should receive more attention than those of other workers, and it is generally conceded that any amount of time and money spent upon their study is well justified.

In spite of this fact, as yet the tools of the surgeon have not been standardized in any satisfactory way. Any classification made of the tools of a hospital shows that the tool situation is positively pathetic and ridiculous, this present state being the outcome of the incentive which ever exists to design special tools. This condition can be realized by subjecting the present tools to the tests of motion study. At present many individually owned, specially designed tools vary so slightly from the instruments of the hospital that the operating room nurses acknowledge that they continually get them mixed up with the instruments furnished by the hospitals for the same kind of operations. The general tools of the hospital are by no means as carefully selected as are those of the trades and factories.

The standardization of the tools alone is not sufficient; equipment and surroundings must be subject to the same process of measurement and standardization. The standardization of the location of the large pieces of equipment and the arrangement of the small pieces and tools in an obvious sequence, that new cycles of motions may have that speed that comes with long practice due to the standardization of the location and habits of sequence, has already been determined with great

accuracy. These laws apply to the motions of surgery just as to all other work. Some may say that other things are more important in surgery. To this the reply is that motion study standardizations in no way interfere with the other processes of the surgeon or his clinic, and experiments show that there can be a saving of more than ten per cent of the time that the patient is under ether in the average operation and, at the same time, give the surgeon more time to do his work with less distraction.

3. The motions used by the surgeon offer the most fertile field of investigation in that they also are at present in a surprising state of lack of standardization.

4. Most important of all, the surgeon is, psychologically, by far the most interesting subject possible for motion study. The product which he handles is the most valuable, his own attitude and that of all concerned has the most effect upon the outcome, and the effect of any changes made is the most deeply and widely felt.

The law for obtaining standards that automatically increase in efficiency consists of:

1. Finding the units in which to measure the desired standards.

2. Determining the methods of measuring the above units.

3. Securing such devices as will make the cost of measuring these units inexpensive.

It has been difficult to determine properly the units of measurement in surgery. The "cost per patient" has often been advanced as a unit of measurement and is apt to be the first unit mentioned when one talks hospital efficiency. Yet this unit is comparatively unimportant.

The variable of the motion is the elementary unit of measurement of surgery and is the unit for determining the efficiency of the hospital. Until this fact is recognized the surgeon cannot possibly obtain methods of least waste. The variable of the motion is also the unit for measuring efficiency in the industries and in engineering works and where this is recognized in determining the methods workers have achieved astonishing increases in efficiency, sometimes as great as three to sixfold increase in productivity with better resulting product, less fatigue, and more lasting satisfaction in the outcome. The motions of the surgeon are, then, the units that are to be measured.

The devices to be used in making these motion studies and time studies are determined largely by the type of work and worker to be studied.

Having determined and tested the elementary motions, the next step in standardizing the methods of work is to select and combine these motions into standard cycles and these cycles into standard methods. In order that this may be done, it must be decided, first of all, exactly what work is actually necessary.

It has been found by long investigation that to get the greatest output with the least fatigue the following points must be noted:



1. All unnecessary work must be eliminated.
2. Each kind of work requires its own percentage of rest for overcoming the fatigue it causes.
3. Fatigue must be recognized and rest periods must be provided for overcoming fatigue.
4. Each kind of work requires its own number of rest periods for the greatest output and least fatigue.
5. Too few rest periods will increase the total percentage of time for over-coming fatigue.
6. Too many rest periods in a given total of time of rest for overcoming fatigue will reduce the quantity of output with a given amount of fatigue.
7. Standard practice is less fatiguing than un-standardized practice.
8. Devices can be used to reduce fatigue of necessary work.
9. Devices can be used during the rest period to ensure quicker recovery from fatigue.
10. After the most economical periodicity of the rest intervals for the recovery from fatigue have been determined, the final step is to discover and standardize the motions of the method of least waste that make up the work intervals.

Having determined exactly what work is necessary the elements may be combined to show how this work may be done in the most efficient manner. The result is the standard.

There are two ways in which surgeons can contribute to this process of standardization:

1. By an intensive physiological study, which will help in determining the ultimate units to be measured in all activity.

2. By being the first and foremost to volunteer individually and as a body to submit their work to accurate measurement.

There is absolutely no excuse for surgeons, who rejoice in a general and special education which is broader than that enjoyed by any other profession, not understanding exactly what the science of management is attempting to do and not stepping forward as a body to lead the way in this great achievement of the twentieth century.

It is obvious that the results of so doing would be a great help to science and a benefit to the entire world. It would mean the establishment of at least one standard hospital with standard practice, and the dissemination of standards which is not possible today. It would mean a race of super-skilled, each one trained with the best methods and ready to teach the work of efficiency to others who are fitted for it. It will mean co-operation which is based upon a knowledge of what should be done, how it should be done, and who can best demonstrate and teach it.

EDWARD L. CORNELL.

# GYNECOLOGY

## UTERUS

**Balfour, D. C.: Cancer of the Uterus; Its Surgical Treatment.** *Texas St. J. Med.*, 1916, xii, 140.

Between 55 and 60 per cent of the carcinomata of the cervix seen at the Mayo Clinic are of the advanced type. It is usually quite obvious that they are not surgical in the sense that the disease may be extirpated satisfactorily. However, for such cases there are other means from which positive benefit may be derived: ligation of the blood supply and the use of heat, radium, and deep roentgen-ray exposures. These measures, separately or in combination, usually ameliorate the symptoms, retard the progress of the disease, and improve the health of the patient, often for a considerable period. In many instances the change is remarkable, and in a few there may be enough destructive action on the growth, with sufficient subsequent mobilization of the uterus, to make its radical removal possible.

In hopelessly advanced cases, in which palliative measures seem advisable, the following are advocated: (1) The use of heat after the Percy method, coupled in suitable cases with ligation of the internal iliac and ovarian vessels, or (2) radium, and (3) acetone, when circumstances necessitate other treatment.

Experience with radium has been too short to warrant speaking definitely, but it has already been proved of benefit in the advanced cases where it has been used and it appears to be of value in the treatment of recurrences.

With a primary mortality of from 20 to 25 per cent, we cannot expect any method of educating the public to the necessity of the early operative treatment of uterine cancer to produce marked results.

The basis, therefore, of a successful propaganda against uterine cancer must be a lowering of the operative mortality and a lessening of secondary sequelæ. The increase in the percentage of permanent cures will depend not so much on the character or the extent of the operation as on the opportunity of dealing with the disease in its early stages, and every effort should be made to keep the public from being prompted to delay by a mortality which is forbidding.

In conclusion, the treatment of cancer of the uterus should be as follows:

1. In early cancer of the cervix, thorough cauterization followed immediately by a total abdominal hysterectomy. The latter should be as radical as is consistent with the character of the case and the ability of the surgeon. In a small percentage of cases the condition of the patient may demand a vaginal hysterectomy as the wisest procedure.

2. For moderately advanced cases the use of heat by the Percy method. The surgeon must then decide from the results of this treatment whether a total abdominal hysterectomy is advisable and when. Vaginal hysterectomy should be considered if the patient is a serious operative risk.

3. In advanced cases a determined effort to ameliorate the symptoms and prolong life by heat, radium, etc., is occasionally rewarded by a result which permits of radical operation.

EDWARD L. CORNELL.

**Bancroft, F. W.: Report of a Case of Carcinoma Uteri Treated According to the Percy Method, with Autopsy Findings.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 11.

After giving a careful history of the patient, the operation, and the autopsy findings the author reaches the following conclusions:

There is a mortality associated with the Percy operation. The author's case died with symptoms pointing to a severe toxæmia, and as the autopsy revealed no lesions due to error in technique, the cause of the death must be attributed to the operation itself.

A patient undergoing this operation is under the influence of the anæsthetic from one to two hours. She frequently suffers from shock and the post-operative course is usually associated with a rise in temperature to 103° or 104° F. for several days. Salpingitis, pelvic abscess, and peritonitis are occasional complications. If the neoplasm has involved the bladder, a vesicovaginal fistula may occur.

As a therapeutic agent, the Percy operation must be considered in connection with radium and X-ray. It is unfortunate that no definite figures showing the result of a large series of cases have been published. Until this is done it is impossible to compare its end-result with those derived from treatment with radium and the X-ray.

Percy claims that it stops hæmorrhage and the offensive discharge. He even thinks that a few cases will be enabled to go as long as five years without a recurrence.

If the patient survives the operation the sequels are not severe; on the other hand, while there is no immediate mortality to radium, there are occasional distressing, late complications such as severe rectal tenesmus, proctitis, and rectovaginal fistulæ. Radium workers are most enthusiastic in regard to the results of treatment, and time alone must decide the relative value of the three procedures.

The main facts concerning the findings from the microscopical examination, may be summarized as follows: Certain islands of cancer-cells show ad-



vanced degenerative changes, in many instances reaching to stages of necrosis and dissolution. Others show milder grades of degeneration, and still others have apparently not been affected by the treatment. The latter cells have all the appearance of viable carcinomatous structures, but concerning the ultimate fate of even these well-preserved cells the author does not wish to commit himself.

The intervening structures, i.e., the musculature and connective tissue surrounding the island of cancer-cells have not wholly escaped injury. (The author had been led from Percy's articles to believe that the connective tissue escaped injury almost entirely.) No claim is made that this controverts the experimental work of Haaland, Clowes, and Loeb, and the findings observed by some X-ray workers.

In a case such as the author reports many extraneous factors must be considered, such as the difficulty of determining the viability of the cells by their microscopic appearance, and the uncertainty of knowing the exact temperature of the cautery, and the influence exerted by infection.

C. H. DAVIS.

**Geist, S. H.: The Relation of Endometrium and Ovary to Hæmorrhage from Myomatous Uteri.** *Surg., Gynec. & Obst.*, 1916, xxiii, 68.

The author points out that while hæmorrhage is the commonest and perhaps the most important symptom associated with uterine fibromyomata, no definite explanation to account for this hæmorrhage has as yet been advanced.

A review of the literature shows how much at variance the different theories are. The majority of investigators found that the mucosa was often hypertrophic, and attached to this an etiological significance in relation to the hæmorrhage, while others simply regarded the hypertrophy as a coincidental finding. That the hypertrophy is not dependable on the tumor itself has been proven and likewise that it is not merely due to a passive œdema has also been demonstrated.

The author's material comprised 75 fibromyomatous uteri, in 55 of which the adnexa were also carefully studied. It was found that in 72 per cent, the mucous membrane of the uterus was hypertrophic irrespective of the phase of the normal menstrual cycle; in other words the commonest condition in the mucosa of the pathological bleeding cases is an hypertrophy. The mucosal changes were absolutely independent of the situation and size of the tumor. In a group of cases in which the menstrual history was normal, only 36 per cent showed hypertrophied mucosa and in one case only could this not be explained by the physiological phase. The entire hypertrophic picture of the mucosa resembles very much the change one finds during the normal premenstrual phase and it seems reasonable to suppose that the same stimulus,

namely, some ovarian activity, is the cause of the hypertrophy found in both instances.

Examination of the adnexa in 55 cases in relation to the bleeding and to the change in the mucosa showed the predominance of one type of lesion in the ovary, i.e., a large corpus luteum occasionally cystic. In 62 per cent of the cases showing hypertrophy of the endometrium, this condition in the ovary was found and in only three cases could the ovary be classified as normal. In but two instances in which the mucosa was in the resting stage was this ovarian change present.

The analysis of the foregoing cases shows that when the mucosa is hypertrophic and bleeding is present, the ovary is grossly abnormal presenting either cysts, inflammation, or most commonly a large corpus luteum often cystic in character.

Because of the resemblance between the hypertrophy associated with fibroids and the normal premenstrual hypertrophy it is suggested that the same stimulus, perhaps perverted in one instance, is the cause of the hypertrophy. Vascular obstruction cannot account for the change in the mucosa for in cases with subperitoneal and small intramural tumors, where there is no marked vascular obstruction, we find the same change associated with pathological bleeding. In fibroid cases with normal menstrual history we find that the mucosa corresponds to the normal phase of the menstrual cycle.

Further support of the theory that the changed ovarian function, most likely corpus luteum, is the etiological factor, is offered by the evidence of X-ray therapy. This method of treatment stops hæmorrhage in myomatous cases long before the size and situation of the tumor can be affected. It is known that it is the ovary, particularly the more mature follicles, that are first affected.

The clinical behavior also lends weight to the author's theory, for fibroids which are associated with pathological bleeding do not bleed during pregnancy. We know that the ovarian activity to a great extent is in abeyance during this period and feel justified in assigning the important rôle in causing the cessation of hæmorrhage at this time to the functional inactivity of the ovary.

The conclusion is drawn that because of the foregoing facts, disturbance in the function of the ovary, perhaps of the corpus luteum, is a probable etiological factor in the atypical hæmorrhage associated with fibroids.

**Findley, P.: Prolapse of the Uterus in Nulliparous Women.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

The author reports two cases of prolapsus uteri in women who have borne no children. Virginal prolapse of the uterus occurs with greatest frequency in the newborn and in most instances there are associated congenital defects, notably spina bifida.

Approximately 86 per cent of procidentia in the newborn is associated with spina bifida. The

percentage would be higher if cases of spina bifida occulta were included. The explanation of the frequent association of procidentia and spina bifida lies in defective innervation of the uterine supports. An infantilism exists in most, if not all cases of procidentia in nulliparous women. Poor nutrition and strain are contributing factors in many cases. The relation of mental defects to prolapsus uteri in nulliparous women is strikingly illustrated by a series of cases recorded by Kepler.

#### MISCELLANEOUS

**Graves, W. P.: Practical Aspects of the Ovarian Secretions.** *N. Y. St. J. Med.*, 1916, xvi, 394.

The author's aim is to point out certain facts of practical clinical importance regarding the physiological action of the ovarian secretions. The results of his investigation are summed up as follows:

1. Genital atrophy, the result of temporary or permanent cessation of ovarian function, may cause abnormalities of great gynecologic importance.
2. Circulatory disturbances of the external genitals, such as kraurosis and furunculosis of the vulva, may be relieved or cured by the administration of ovarian extract.
3. Ablation symptoms are, in the great majority of instances, markedly relieved by administration of ovarian extract.
4. After hysterectomy, vasomotor symptoms follow both transplantation of ovarian tissue and leaving the whole ovary *in situ*, similar in degree and frequency to those following total ablation of the ovaries.
5. Functional amenorrhœa in the young is often relieved by the administration of ovarian extract.
6. In the author's experience extracts of the whole ovary have been more efficacious than extracts of the corpus luteum in organotherapy.

HARVEY B. MATTHEWS.

**Lott, H. S.: Postpuerperal Sterility: Its Cause and Surgical Treatment.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

In this paper the author refers to a group of cases which are most frequently sequels in the confinement of primiparæ, but which may occur later in the childbearing period. As a sequence to mild postpartum infection, the condition resembles, in pathology and results, sequellæ to the exanthemata in early girlhood. The patient's chief complaint is pain, dating back to a labor several years previous, with no distinctive feature save a chill within the first week of the puerperium.

The convalescence, in other respects, seems to be perfectly normal. The menses reappear but the rhythm is broken, the interval being either too short or too long, with some discomfort, amounting to pain, during the flow, which is either too scant or too free; while a moderate leucorrhœa, just after the menstrual epoch, is the rule. In a general way the health is fairly good, and yet not up to normal. The appetite is fitful, and the food is not digested

well, thus bringing the usual sequence of constipation and loss of weight.

As a result of this mild infection there has been a pelvic cellulitis and involvement of the fallopian tubes whereby their fimbriæ have become sealed to the surface of the ovaries. Thus function is abolished and two pain-points are established by distorted anatomic conditions.

The appendix is often caught in the inflammatory reaction and, like the fimbriæ of the tubes, is devitalized with its meso-attachment. Thus its base becomes fixed to the head of the cæcum, with lessening of its lumen and abolition of any possible function. Hence, arises the third pain-point of so much value in the classic group of physical signs distinctive of this pathology.

On physical examination, then, tenderness per vaginam is elicited to the right and to the left of the uterus, while this organ swings free in normal position. Deep pressure just above the left ovary gives pain, though it is not always marked, while pressure on the right shows the usual blend, a tender ovary and also the reflex epigastric discomfort ever coincident with involvement of the appendix.

In addition to the three pain-points, the patient will give a history of pelvic discomfort when walking, most marked on coming downstairs, and a pulling sensation when lying down, especially when lying on the left side. This may be so severe as to prevent sleep. Our chief concern today lies in early recognition of this condition and its prevention.

With the abdomen opened by a median incision, the appendix is sought and removed, with the freeing of any bands that may prevent normal rotation of the cæcum. Each fallopian tube is then palpated to its limit; and each, in turn, with its adjacent ovary brought into view. The fimbriæ, if fastened to the surface of the ovary, are gently freed, and a filiform bougie passed through the lumen of the tube to the limit of the uterine cavity, thus freeing any possible occlusion and establishing its patency. This is particularly important if there has been pain during menstruation. A half pint of normal saline solution is introduced into the cavity just before closing the abdominal incision. This last step is important, the solution assuring that the fimbriæ float free a short time, so that their edges do not again become agglutinated to the surface of the ovary.

The authors results in the few cases in which this procedure has been used have been gratifying. The pain-points have disappeared, and the patients walk, and lie on either side with comfort. The appetite has returned, and digestion is good, with resultant gain in weight. Of prime importance is the fact that menstruation resumes its normal cycle without discomfort.

**Pemberton, F. A.: Dysmenorrhœa with Ante-flexion and Retrocession.** *J. Mich. St. M. Soc.*, 1916, xv, 365.

Many patients suffering from dysmenorrhœa are found, on examination, to have a small ante-flexed



uterus which is situated lower down and further back in the pelvis than usual, a position called retrocession. This position is probably due to a deficient development of the uterine musculature which, under normal conditions, enormously increases at puberty. It has been the author's experience to find in the majority of these cases that the cervical canal is not obstructed.

When the abdomen is opened, these uteri are found to be slumped down in the hollow of the sacrum. On lifting them up, they are felt to be flaccid and, if drawn up by the round ligaments, they straighten out perfectly because they are so limp.

The operative procedure carried out is as follows: The cervical canal is first dilated in order to overcome the obstruction, if it is present. No curetting is done unless there is indication for it. The commonest indication is a chronic endocervicitis which is sometimes found in these cases, and if such a condition is present, the cervical canal is thoroughly curetted and then cauterized by the insertion of a thin-bladed actual cautery, first with the plane of the blade in the anteroposterior direction and then at right angles to this.

Next the abdomen is opened and examined for any pathological process, which is remedied if present. Then the uterus is drawn up and the round ligament sutured to the anterior abdominal wall at points above the pubes on each side of the incision so that the uterus can be left to be straightened out by silk sutures passed around the round ligaments one-half an inch from their insertion into the uterus, and through the peritoneum, muscle, and fascia of the abdominal wall. This point of attachment on each side is one to one and one-half inches above the symphysis. Careful examination shows that this is done without pulling up on the vagina.

This operation has been done 86 times with no mortality. These were cases which showed only antelexion with retrocession, there being no pathological process, such as adhesions, fibroids, etc. Of these cases, 44 have been traced: 4 of these patients say that they are entirely relieved of their symptoms; 9 say they are much better; and 23 say they are better than before operation. Of the remaining 8, 7 are no better and one is worse. That is, approximately 80 per cent have been benefited by the operation.

In regard to length of time since the operation of those benefited: 17 per cent were done 5 years ago; 17 per cent were done 4 years ago; 42 per cent were done 3 years ago; 11 per cent were done 2 years ago; 11 per cent were done 1 year ago.

Of those not benefited by the operation, only one said that she was relieved for a few months and then relapsed to her former condition.

EDWARD L. CORNELL.

Newell, C. H.: A New and Simple Operation for Uterine Prolapse. *Med. Herald*, 1916, xxxv, 303.

The technique of the operation is as follows:

1. The abdomen is opened by the incision of

choice, the uterus freed from any pathological attachments and brought into the incision in the middle line.

2. If the patient has not passed the menopause, the tubes are bisected, the distal part remaining intraperitoneal and the proximal part extraperitoneal when the operation is completed. For obvious reasons the simple tying off of the tubes is not sufficient.

3. Dissect the bladder off the cervix as in an abdominal hysterectomy, thus freeing the bladder, and then, by attaching it by its free peritoneal edge to the parietal peritoneum in the middle line, leaving it well elevated when the operation is finished.

4. From this point continue to unite the parietal peritoneum to the cut edge of the visceral peritoneum on either side to the point where they come together on the lateral wall of the uterus.

5. Continue to unite the peritoneum to the uterus by interrupted sutures on either side ascending along the lateral wall of the uterus and finally joining the two edges of the peritoneum on the posterior surface of the uterus just below the level of the tubes, thereby leaving all of the fundus above the level of the tubes and almost the entire anterior surface of the uterus extraperitoneal.

6. Next close the peritoneum completely from the point of its approximation on the posterior surface of the uterus to the upper angle of the incision. (From this point on the operation is entirely extraperitoneal.)

7. Two silk sutures are now passed, each beginning on one side, passing through the fascia and muscle, firmly embedded in two places in the denuded area on the cervix, passing again under the muscle and out through the muscle and fascia. The free ends are tied together, firmly fixing the cervix to the anterior abdominal wall.

8. Two chromic gut sutures are applied exactly as the two silk sutures except they are passed through the fundus of the uterus, thus firmly fixing the fundus to the anterior abdominal wall. Both the silk and the chromic sutures are to be applied in the anterior abdominal wall at such a level as to insure a sufficient elevation of the pelvic floor, bladder, and rectum. This level necessarily varies with each case.

9. Several figure-of-eight chromic gut sutures are fastened, first, through the muscle (not the fascia), then through the uterus in its fundus and again through the muscle and tied across the middle line. These sutures serve a double purpose: first, they offer some support to the uterus and, what is more important, they eliminate the space between the uterus and the musculature. One may or may not scarify the uterus at the sight of its future attachment to the abdominal wall.

10. The abdomen is now closed in the usual manner and, pursuant of the endeavor to approach as nearly as possible the normal anatomical condition, perineorrhaphy is done if indicated.

EDWARD L. CORNELL.



**Rabinovitz, M.: The Ductless Glands and Their Relation to the Treatment of Functional Gynecological Diseases.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 177.

After discussing at considerable length the various ductless glands and their interrelation, the author comes to the following conclusions:

1. Functional gynecological diseases should be studied objectively and not subjectively only, applying the same methods of investigation as are employed in the detection of organic disorders.

2. The pathology of functional diseases is outside the realm of cellular morphology. It invades the fields of physiology and biochemistry. Many of these disturbances are so subtle in nature, that they escape detection by the present means at our disposal, and some will probably never be solved.

3. To define a disease as functional we must be assured that all organic factors have been eliminated. For just as much harm may be done by submitting organic cases to functional therapy as by applying surgical treatment to some functional diseases.

4. It is not sufficient to merely ascertain which gland of the endocrine series is responsible for certain functional disturbances, but it is also essential to be informed about the interglandular relation that this gland bears to the other ductless glands under normal and abnormal states.

5. Owing to the intra- and interglandular reciprocity that exists between the ductless glands, a functional disease is in its final analysis never a uniglandular but a polyglandular malady. It is true that the predominant symptoms are characteristic of the disturbances of the gland that is mainly affected, but the concomitant disturbances are just as important and are due to the involvement of other ductless glands, which have been acted upon by this particular gland and which in turn react upon it.

6. The ideal in organotherapy will be reached when, (1) functional diseases will be properly diagnosed; (2) when the organic products offered for sale will be standardized and possess a stable physiological potency; (3) when the active principle, not only of each gland, but of the different parts of the compound glands, such as the ovary, the hypophysis, and adrenals, will be isolated.

C. H. DAVIS.

**Harada, T.: The Nature of the Bactericidal Property of Vaginal Secretion.** *Am. J. M. Sc.*, 1916, clii, 243.

Harada gives a résumé of what has been done and said regarding the bactericidal properties of the vaginal secretion. Judging from this review, the author concludes that there is a wide diversity of opinion relative to the cause of the bactericidal property of vaginal secretion.

Following this introductory discussion, the author gives, in rather full detail, the results of various experiments to solve this much disputed question. A general summary of his experiments follows:

1. The bactericidal property of pregnant vaginal secretion is not greatly affected by different bacilli.

2. The bactericidal property of pregnant vaginal secretion is gradually increased during the course of pregnancy.

3. An increase of 0.9 per cent of lactic acid is contained in pregnant vaginal secretion.

4. The lactic acid does not increase during the course of pregnancy.

5. The bactericidal substance in pregnant vaginal secretion is not of the nature of bacteriolysin, which is completed by association with complement.

6. The bactericidal property of pregnant vaginal secretion is caused by "leukin," "cytose," or allied substances and lactic acid. HARVEY B. MATTHEWS.

**Riggles, J. L., and Lind, J. E.: The Possible Etiology of Pelvic Disease in Epilepsy.** *Virg. M. Semi-Month.*, 1916, xxi, 161.

It is a fairly well accepted idea now that in an individual predisposed to epilepsy the reflex irritation from some pathological condition, even in such a place as the peritoneal cavity, may cause seizures. The mental and physical activities of a woman reach a high point just before her menstrual period and, when obstructive dysmenorrhœa is present, the nervous discharge is diverted and there is great suffering, not only in the abdomen, but through the system generally, but especially the nervous system. The question of possible motor irritation resulting in excessive muscular action or spasm must be inquired into, because the presence of either tonic or clonic convulsions implies irritation of motor centers, motor tracts, or motor nerves, but motor irritation may also be excited secondarily in some reflex way, the result being a reflex spasm. The full control of the functions of the pelvic viscera, as, for example, the bladder, is dependent upon the reflex centers of the spinal cord and the integrity of the afferent and efferent nerve-fibers constituting the arcs from these organs to the cord.

The authors report the case of a white female, aged 56 years, operated on ten years previous after having had hystero-epilepsy for 15 years. Following the operation she had had no seizures. Menstruation was not established until she was 17 years old and dysmenorrhœa was always present preceding the flow, which lasted from six to ten days. She was married at 18 and one year later was delivered of her first child; the labor was normal, lasted two days and no instruments were used. Three other labors came at intervals with nothing unusual about them. At the age of 32 (26 years ago) she was delivered of her last child; the labor was prolonged and hard, but no instruments were used. Following this labor the menstrual flow became irregular, with increased dysmenorrhœa and she suffered from pelvic pains, backache, and dragging sensations in the iliac regions. These symptoms were almost constant and rapidly exhausted her general strength.

The nervous system seemed to suffer most and,



two years later, while undergoing one of her attacks of dysmenorrhœa, she had a convulsion. For a few years following this, each period was preceded by one of these seizures and after the appearance of the flow, which relieved the colicky pains, she would be quite comfortable. Her condition gradually grew worse and convulsions occurred at frequent intervals, without regard to the time of the month, eight typical attacks developing in one day.

On October 1, 1906, she was attacked with severe colicky pains in the right iliac region. Superficial pressure caused increased suffering, while deep pressure relieved her a little. At operation a double hydrosalpinx and one cystic ovary were found and removed.

This case emphasizes the value of a thorough physical overhauling in cases of epilepsy, especially those developing comparatively late in life, in order not to overlook any possible form of trouble which may not be obviously connected with the central nervous system. In women the pelvic viscera should be especially scrutinized on account of the important part which they play in the physiology and psychology of women. EDWARD L. CORNELL.

**Carstens, J. H.: Points in the Diagnosis of Pelvic Troubles.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

The author regards cases of pelvic adhesions where women are suffering and complaining the most difficult of all to handle. Often nothing of importance can be detected; the history may be perfectly clear; physical examinations reveal everything in perfect place, but they have pain when standing, and doing even light work, or at defecation, or when a little gas rolls around in the intestines. On careful physical examination these patients are sensitive when the uterus and the pelvic organs are moved in certain directions. If the uterus is pushed to the right they complain of severe pain in the left side, or in the opposite direction on the other side. When the uterus is pushed away from the bladder no complaint seems to be made, but when the uterus is pulled forward, or away from the rectum, severe pain is complained of, often also in the back. The trouble in these cases is usually due to adhesions, and the adhesions are caused by infection from the rectum and sigmoid, as these patients often are suffering from chronic constipation. In many cases it is difficult to convince the patient that an operation is necessary where they have always been in perfect health before. There are many such cases where the history is perfectly clear as to the non-existence of any previous trouble, such as a gradual onset of pain and distress, much increased when moving the uterus and the pelvic organs, as described above.

In conclusion he says:

1. Naturally, all pelvic troubles offer difficulties in diagnosis.

2. Pain on moving the uterus or pelvic organs indicates adhesions.

3. These adhesions are probably caused by infection from the bowels.

4. These obscure cases require exploratory cœliotomy for perfect diagnosis and treatment.

**Darnall, W. E.: The Relation of So-called Ether Pneumonia to Pelvic and Abdominal Surgery.** *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

One of the most difficult things about the science of medicine, which is yet in its developmental and formative stage, is that as scientific knowledge advances we have to discard so many things we have learned. Theories and impressions received today have to be revised tomorrow by the discovery of new facts. To give up an idea or an impression that has been firmly implanted in one's mind for years and readjust oneself to changed ideas based on new discoveries is not always easy.

For many years it was commonly taught that ether irritated the bronchi and was largely the cause of what was known as postoperative pneumonia. Such pneumonia was spoken of and still is in most hospitals as "ether pneumonia." Yet any surgeon in reviewing his experience may find many facts to disprove and few or no reasons to prove that ether is the cause of pneumonia after an operation. It is astonishing that this misconception that ether has a harmful effect on the air passages is so widespread. In reality the correctness of this view has long since been refuted both clinically and experimentally.

Ether is administered in most hospitals many times each day, yet the condition known as ether pneumonia is a rare occurrence compared with the number of ether administrations given. If the pneumonia were the result of the ether we ought to expect to have many cases every week. Again, if ether produced all the havoc it has been credited with the administration of it by the intratracheal method might almost come under the classification of criminal malpractice. Yet we know that this is done safely every day.

Rovsing has proved experimentally that although ether does occasion increased secretion of the salivary glands of the mouth, the larynx, the trachea and the bronchi are not irritated at all, even when the animals are killed by administering ether through a tracheotomy tube. The only way therefore that ether can produce pneumonia is by the aspiration of the accumulated saliva in the throat, usually the result of technical error on the part of the anæsthetist who should not allow the secretions to accumulate in the throat. Such secretions may of course be easily infected from the buccal cavity. It is quite possible under such circumstances that tonsillar infections, involvement of the nasal accessory sinuses or the teeth might be one of the causes of postoperative pneumonia which has been attributed to ether. Attention has frequently been called to the importance of the sanitation of the nose, throat, and mouth before all operations.



Miculicz, as long ago as 1898, on account of the somewhat frequent occurrence of postoperative pneumonia, had discarded ether and taken up chloroform in the belief that the pneumonia was due to the irritating effect of the ether. To his great surprise it appeared that the cases of chloroform were followed by a still greater percentage of pneumonia. He therefore decided to give up narcosis by inhalation entirely and thereafter employed local anæsthesia in all operations, even major ones. To his great surprise the result was that the lung complications, far from decreasing, increased to a considerable extent. He had 27 such cases in 114 laparotomies. This experience overthrew the old conception that postoperative cases of pneumonia were due to inhalation narcosis.

Cunningham's very thorough work on the development of the lymphatics of the lung are both interesting and illuminating. He found that the lymphatics approach the lung from three different sources: From the two jugular sacs there are right and left lymphatic trunks, and from the retroperitoneal sac there are vessels which come up behind the diaphragm. The ducts which grow down from the neck meet in a plexus which surrounds the trachea. In the primitive lung the general pattern of the organ is very simple. It is obviously blocked off into large lobules by wide connective-tissue septa. In the center of each lobule are the bronchus and the artery; in the septa are the veins. At the hilum the tracheal lymphatics divide into three plexus, one spreading on to the pleura, a second following the arteries, and the third the veins. The plexus which follows the veins grows rapidly to the pleura and spreads around the border of each primitive lobule, blocking off the pleura into polygonal areas. From this pattern the pleural lymphatics develop. At a much later stage the lymphatics grow down from the center of the lobule along the bronchi.

The lymphatics of the diaphragmatic surface of the pleura grow up behind the diaphragm from the retroperitoneal sac. This relation of the pleural lymphatics to the abdominal lymphatics is of the greatest importance in the consideration of the development of pleurisy and pneumonia following abdominal conditions of a septic nature. It is clearly seen, therefore, how easily infections may travel from the pelvis or other parts of the abdominal cavity up through the retroperitoneal lymphatic system to the pleura, the base of the lung, or the bronchi.

If pneumonia after an abdominal operation is regarded in the same light as the development of a subphrenic abscess after an appendectomy, they will be seen to bear the same analogy to the point of original infection. The only difference is that in the one case the new focus of infection locates above the diaphragm and in the other underneath it, but both are brought about by the carrying of infection from the original source in the abdomen up through the lymphatics and veins by the retroperitoneal route.

This idea is further strengthened by the fact that most postoperative pneumonias will show a mixed infection containing streptococci, colon bacilli, or other organisms, in addition to pneumococci. On the other hand, it is often true that the appendix, the gall-bladder, the fallopian tubes, and the ovaries may be the seat of a pneumococcus infection.

Says Rovsing: "One curious fact should long ago have aroused the surgeon's suspicions, namely, that almost every so-called ether pneumonia manifested itself after a laparotomy, while it is extremely rare to find pneumonia following operations on the extremities, or the thorax, or the head. This occurrence is too unusual to pass by unnoticed. In the main it is due to two circumstances: (1) That peritoneal infection is conveyed to the lungs partly by way of the lymph-vessels and venous blood and partly by embolism. (2) That the sore-bellied patient after an abdominal operation does not dare cough or breathe deeply for fear of causing himself pain. The result is imperfect aeration of the lung, and imperfect elimination of secretions. If, therefore, the patient is already suffering from bronchitis, or if an infection of the lung sets in, the development of pneumonia is greatly favored and encouraged by the deficiency in expectoration and lung ventilation."

In this connection it should be remembered as a matter of history that the first employment of ether in medicine was as an inhalation remedy for certain lung diseases such as asthma, emphysema, bronchitis, etc. Rovsing is authority for the statement, which is borne out in the experience of others, that in certain badly afflicted lung patients who have to submit to operation that ether is not only well tolerated but in a good many cases it seems to have a quite specific beneficial effect on such lung conditions.

It would seem proper to conclude, therefore, that cases of pneumonia following operations are not due to the ether. The term "ether pneumonia" should be discarded and forgotten. Postoperative pneumonia occurs with great rarity except after abdominal operations, and is then probably due to an infection existing in the bronchi or lungs at the time of operation, or to imperfect aeration and ventilation of the lungs by reason of the fear of taking deep breaths after a laparotomy, but most often such pneumonia is a secondary infection of the lung following a septic abdominal condition.

**Cullen, T. S.: Adenomyoma of the Rectovaginal Septum.** *J. Am. M. Ass.*, 1916, lxvii, 401.

Myomata occurring in the septum between the vagina and the rectum have long been known and some of them have reached such a size as to encroach markedly both on the vagina and on the rectum. In the male, so-called rectal myomata have been noted. In one case the tumor was as large as a coconut and at first was thought to be an inoperable malignant growth. The short but com-



prehensive article on the subject by Descoedres is well worth a thorough study.

The following tentative classification may be made:

1. Small adenomyomata lying relatively free in the rectovaginal septum.

2. Adenomyomata adherent to the posterior surface of the cervix and at the same time to the anterior surface of the rectum.

3. Adenomyomata gluing the cervix and rectum together and spreading out into one or both broad ligaments.

4. Adenomyomata involving the posterior surface of the cervix, the rectum, and broad ligaments, and forming a dense pelvic mass that cannot be liberated.

On vaginal examination one can detect a definite thickening. This may be situated in the posterior wall to the right or left of the cervix, but is usually directly behind it. It may vary from 1 to 3 or 4 cm. in breadth. The thickening is occasionally nodular. As a rule, however, it is diffuse, hard, and reminds one of dense inflammatory tissue or of a small adherent myoma. In some cases the nodule moves with the cervix as if the two made up a single piece. In other cases the nodule also seems firmly fixed to the rectum. In a few cases the vaginal mucosa over the nodule has been puckered and is of a bluish tinge.

On rectal examination these tumors, if situated directly behind the cervix, can often be more clearly felt than through the vagina. If the growth be adherent to the rectum, the bowel over this area is splinted and hard and does not yield. The rectal mucosa, however, even over the growth, is, as a rule, perfectly normal, although the tumor may project slightly into the lumen of the bowel.

The growths, whether large or small, discrete or diffuse, consist of non-striated muscle and fibrous tissue, and have scattered throughout them typical uterine glands. These glands may occur singly and lie in direct contact with the muscle or may be found in groups. As a rule they are separated from the muscle or fibrous tissue by the characteristic stroma of the uterine mucosa and at many points may be seen islands of stroma devoid of glands. In some of the glands fresh blood may be found. More frequently, yellowish-brown pigment is noted in clumps scattered throughout the stroma. This pigment is the remnant of old bleeding.

Histologically these growths are identical with adenomyomata of the uterus.

The most pronounced symptom is profuse men-

struation. In some this is painless, in others accompanied by great discomfort. Rectal pain is also a prominent feature in some cases.

When the growth is small, is not adherent to the rectum, and has not spread out into the broad ligament so that it has begun to exert pressure, few, if any, symptoms can be expected. In those cases, however, in which the adenomyoma has become adherent to the rectum, there is a tendency to pain in the rectum, with or without painful defecation.

When the growth has invaded the broad ligament and encroached on the nerves, we may expect discomfort referable to this region, due, in the first place, to the pressure on the nerves, and, in the second place, to the swelling of the tumor at the menstrual period. Profuse periods seem to be the rule.

Some might argue that simple removal of the appendages would cause atrophy of the uterine mucosa contained in the adenomyomata of the rectovaginal septum.

Where small discrete nodules exist in the posterior vaginal vault, these may be readily removed through a vaginal incision.

Where the growth occupies the posterior surface of the cervix and extends laterally, after the ureters have been dissected out carefully a complete abdominal hysterectomy should be performed:

If the growth be firmly adherent to the rectum, a wedge of the rectum should be removed, together with the uterus. It has been found best, after freeing the uterus on all sides, to open up the vagina anteriorly and laterally. The uterus and the rectum can then be lifted farther out of the pelvis, thus facilitating the removal of the necessary wedge of the anterior rectal wall. The uterus really acts as a handle, and the necessary rectal tissue and the uterus are removed as one piece.

Where the lumen of the bowel is greatly narrowed, a complete segment of the rectum should be removed with the uterus and an anastomosis should be made.

In desperate cases, where everything in the pelvis is glued together, an ideal operation is out of the question. The patient will not stand a long operation, and, if she could, a satisfactory result could not be obtained. In such a case it would be better to cut across the sigmoid, invert the lower end, close it, and bring the upper end out through the abdominal wall of the left iliac fossa, making a permanent colostomy. When the patient has, to some extent, regained her strength, the uterus, the lower portion of the rectum, and the broad ligament tissue can be shelled out as one piece.

EDWARD L. CORNELL.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Scheult, R.: Observations on the Frequency of Puerperal Eclampsia.** *J. Obst. & Gynec. Brit. Emp.*, 1916, xxvii, 173.

The author presents a carefully tabulated report of 22 cases of eclampsia, with interesting statistics relative to this complication in the Island of Trinidad. Within a period of six years, 1908 to 1914, there were 2,847 deliveries in the Colonial Hospital, 122 of which were complicated with eclampsia, or 1 in 23. During three years, 1911 to 1914, there were 6,122 births in Port-of-Spain, during which time 24 women died from eclampsia; in the whole colony, during these three years, there were 35,425 births, and 82 deaths from this disease. Assuming a mortality of 23 per cent, slightly higher than that recorded in the hospital service, it would appear from these data that the percentage of eclampsia in Port-of-Spain is 1 in 58.64, and in the colony, 1 in 99.36.

In taking up the theories of hepatic or renal insufficiency as factors in the etiology of pregnancy toxæmia, the author is unable to arrive at any satisfactory conclusions, though nephritis is a very common disease in Trinidad. Of 1,041 primiparæ delivered during the six years covering this report, eclampsia developed in 77, or 1 in 13.5. Of 1,806 multiparæ it developed in 45, or 1 in 40. Sixty-nine twin pregnancies were recorded; of these eclampsia was associated in 7, or 1 in 10. Of the 122 cases, 106, or 87 per cent, occurred in women between the ages of 14 and 30 years. The attacks supervened before labor in 40.16 per cent, during labor in 23.77 per cent, after labor in 36.06 per cent.

Among the 122 cases 28 mothers died, or 22.9 per cent; 17 were primiparæ, 11 multiparæ. The percentage of deaths among the ante-, intra-, and post-partum cases was 36.7 per cent, 20.6 per cent and 9 per cent respectively.

Of the 129 infants born, 44 died in parturition, a mortality rate of 34 per cent. Eleven others died within nine days, raising the total foetal mortality to 42 per cent.

CAREY CULBERTSON.

**Harris, J.: The Treatment of Eclampsia.** *Med. J. Austral.*, 1916, ii, 55.

During the last five years 124 cases of eclampsia (ante and post-partum) were admitted to the Royal Hospital for Women, Paddington. Of these 20 patients died, a death-rate of 16 per cent. This rate could easily be reduced if the patients were sent in earlier. Some of these patients were moribund when they arrived and lived only from half an hour to less than twenty-four hours after admission. A

large number of cases, which were not in labor, have been treated and the children born at full time without the slightest trace of the previous illness.

The points given special prominence are: (1) get the bowels open, (2) give veratrine, (3) get the skin and kidneys to act, (4) do not deliver patient if not in labor, but give aid in labor when nearing full-term.

EDWARD L. CORNELL.

**Goldsborough, F. C.: Toxæmias in Pregnancy.** *J. Mich. St. M. Soc.*, 1916, xv, 328.

Goldsborough believes a differentiation between the two types of toxæmia, eclampsia, and nephritic toxæmia is possible, both clinically and pathologically. Clinically, from a study of the catalytic activity of the blood, as described by Winternitz and Ainley, and a study of the blood-pressure, a distinction is possible.

The catalytic activity of the blood is decreased in cases of chronic nephritis, normal in cases of eclampsia.

The blood-pressure is high in both types of toxæmia, but is believed to fall to normal rapidly in convalescence from eclampsia; and to fall more slowly following recovery from nephritic toxæmia. The urinary findings are not considered of much service in the differential diagnosis.

Pathologically the liver shows the typical areas of necrosis in eclampsia, while the cases of nephritis have a characteristic kidney.

D. H. BOYD.

**May, A. H.: The Nephritic Toxæmia of Pregnancy.** *N. Y. M. J.*, 1916, civ, 253.

May believes the pressure on the renal excretory apparatus exerted by the weight of the pregnant uterus with the woman in the recumbent position may be a cause of nephritic toxæmia, due to an obstruction to the excretion of urine with resulting trauma to the kidney parenchyma. To alleviate this pressure he has devised a bed composed of two pieces, a head piece and a foot-piece with a rubber sheet connecting the two pieces. The patient lies face downward and the rubber sheet is adjusted to support the protuberant abdomen but to relieve all pressure on the ureters and kidney. He advises this position as a prophylactic measure, and as a curative measure, in addition to the usual method of treatment.

D. H. BOYD.

**Findley, P.: Rupture of the Scar of a Previous Cæsarean Section.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 411.

The author has collected all the cases of rupture of the scar of a previous cæsarean section which have



been reported in the literature and has added a number of cases from personal communications with various operators. From his study of the subject he concludes that:

1. A perfectly healed cæsarean wound may be relied upon to resist the forces of labor, but in view of the fact that the integrity of the wound is an unknown factor in all cases we are constrained to exercise the utmost caution in the conduct of every case in pregnancy and labor following cæsarean section.

2. Failure to secure perfect healing is accounted for by departure from the principles of suture proposed by Sanger and by septic infection of the uterine wound. If we are to obtain the uniformly good results in respect to wound healing that were obtained in the decade following the introduction of the Sanger method of suture these principles must not be deviated from.

3. The possible existence of latent gonorrhœal infection may defeat the most painstaking efforts to secure perfect wound healing. Hence, it follows that the healing of a cæsarean wound is always an uncertain factor.

4. When cæsarean section has been followed by a fever course the uterine wound should be regarded as insecure in event of a subsequent pregnancy, and should call for a repeated cæsarean section at the onset of labor.

5. Sterilization and hysterectomy should replace conservative cæsarean section when infection is known to exist. The alternative invites faulty wound healing, if not more disastrous results.

6. Transverse fundal, extraperitoneal, and cervical incisions have not lessened the liability of rupture in subsequent labors, but, on the contrary, have probably increased the hazard.

7. The possibility of rupture of the scar following cæsarean section does not justify sterilization, but rather calls for the exercise of masterly control in event of a subsequent pregnancy. All such cases should be hospital cases and labor should be anticipated by timely repetition of cæsarean section at the onset of labor if the uterine wound is known to be defective or if some cause for obstruction to the delivery of the child through the natural passage exists. Version, high forceps, uterine tampons, hydrostatic bags, and pituitrin should never be employed in the presence of a cæsarean scar.

8. Finally, it may be concluded, in view of the evidence, that not more than 2 per cent of ruptures occur in subsequent labors. There is no justification in the slogan "once a cæsarean section, always a cæsarean section," neither should explicit reliance be placed upon the integrity of the uterine scar in any case. Furthermore, it should be borne in mind that the liability of rupture is a real danger and should stand as an argument against the increasing tendency to widen the scope of elective cæsarean operations.

C. H. DAVIS.

**Tracy, S. E.: Gestation Complicated by Appendicitis.** *Penn. M. J.*, 1916, xix, 826.

The author tells of his method of treatment and results in a series of 26 cases of gestation complicated by appendicitis in which 10 were cases of uterine gestation, 3 during the puerperium, and 13 were cases of ectopic gestation in which the appendix was either acutely inflamed, subacutely inflamed, or adherent to the gestation sac, hæmatocele, appendage, or uterus. Of the 10 cases 8 were operated upon. One patient refused operation and miscarried six weeks later, at the fifth month of gestation. One patient within two weeks of the expected delivery, with very mild symptoms which were improving fast, was advised not to have operation. Of the 8 cases subjected to operation, 7 were discharged from the hospital with no interruption of the gestation. One patient seen late in the attack, who was in a desperate condition, was put on the Ochsner treatment. She developed an abscess, was operated on after the acute symptoms had subsided, and miscarried the second day after the operation.

The author is of the opinion that because of the fact that appendicitis associated with gestation and the puerperium seems to run a more rapid and destructive course, surgical intervention should be resorted to early. Should an attack develop during gestation, if seen early, within twenty-four to forty-eight hours of the initial symptoms, the patient should be subjected to operation at once, the same as in the case of a non-gravid uterus. If an appendiceal abscess develops during gestation, the patient should be subjected to operation before the uterus empties itself, as abortion in such cases increases the mortality from 20 to 25 per cent. Early diagnosis and prompt surgical treatment will diminish both the maternal and foetal mortality.

W. D. PHILLIPS.

**Ely, A. H., and Lindeman, E.: Acidosis Complicating Pregnancy; Report of a Case Cured by Transfusion.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 42.

The authors discuss briefly acidosis complicating pregnancy, its diagnosis, and report in detail their case of pernicious vomiting of pregnancy which was not relieved by the emptying of the uterus. Some fourteen days after the uterus was emptied, other forms of treatment having failed, the patient was transfused with blood from the husband. Following this transfusion she showed marked improvement and only vomited three times during the next twenty-four hours. One week later she was again transfused and following this made a gradual recovery.

The authors offer the following suggestions:

1. Besides the generally accepted routine of frequent urinary analyses during the entire period of pregnancy, in private cases this should be supplemented by the analysis of the blood as being a more accurate test in determining the actual condition of the patient.

2. Not only should blood of the donor and recipient be compatible but, as illustrated by this case of acidosis and the first time so far as known of its employment, the blood of the donor should be alkalinized by large doses of bicarbonate of soda before transfusion.

3. The method of syringe transfusion provides a comparatively simple and safe means of treatment which produces results not found with other known methods.

4. The timely use of this treatment may obviate the necessity of emptying the uterus in cases of acute and severe acidosis complicating pregnancy.

5. It is possible that with this method of treatment employed not only in the severe type but in the lesser grades of acidosis of pregnancy, much can be done to lessen the number of marasmic infants whose mortality and morbidity is so great during the first months and years of life. C. H. DAVIS.

**Donald, A.: The Care of the Pregnant Woman.**  
*Brit. M. J.*, 1916, ii, 33.

The pregnant woman should be taught how to take care of herself and warned of certain dangers that may arise. In this direction those agencies which have been established with this object, such as are known as schools for mothers, should be encouraged.

The education, both theoretical and practical, of midwives has been much improved lately, but there is still much room for improvement. The routine examination of the urine is most important and would reveal many of the cases of toxæmia which require treatment.

The medical students throughout the country should receive a more thorough training in practical midwifery than is at present the case. In Manchester the medical student is compelled to live in the maternity hospital for a period of four weeks while "taking out" his practical midwifery.

More facilities should be given for medical practitioners to have post-graduate instruction. A week or two spent in a modern maternity hospital would bring many of them up to date in methods of diagnosis, of aseptic precautions, and of treatment generally.

The study of the pathological problems connected with abortion and stillbirth should be stimulated by the provision of well-equipped clinical laboratories in connection with maternity hospitals.

The large cities are now provided with maternity hospitals and this system should be extended to the smaller towns and even to the country districts. Hospitals should be established in different areas and should be visited from time to time by an obstetric surgeon of experience, whose services should be available, if required, for consultation with the local medical men or for the more serious emergencies. In this way the medical men in the district who would be attached to the hospital would have their interest increased not only in the care of the preg-

nant woman, but also in her confinement and in the care of the newborn child.

The solution of the matter is not in statistics and notification, but in education and research.

The health medical officers can do a great deal for the future generations if they will use their influence in persuading the health committees throughout the country to pursue this work through the institutions that are already in existence, and to extend the same system to the less densely populated parts of the country. EDWARD L. CORNELL.

**McGlinn, J. A.: The Management of the Complications of Pregnancy.** *N. Y. M. J.*, 1916, civ, 248.

In the retrodisplaced pregnant uterus postpuerperal examinations are advised to determine the position of the uterus and correct any displacement. After examination the uterus is replaced by manual manipulation and the knee-chest position assumed if possible, and a pessary inserted to prevent recurrence. In incarceration laparotomy is advised and the uterus freed by internal manipulation. Abortion and rupture of the membranes are condemned unless laparotomy is positively contra-indicated.

In the event that ovarian cyst be present, removal of the cyst as soon as the diagnosis is made is considered the only safe procedure.

In cases of pyelitis the treatment is rest in bed, milk diet, and large doses of hexamethylenamine, as much as 60 grains daily. If this fails catheterization of the ureter and lavage of the kidney pelvis is advised.

The salvation of a patient with appendicitis as a complication of pregnancy is considered to depend on early recognition and immediate operation.

The management of intestinal obstruction is the same as when not complicated by pregnancy.

For fibroid tumor, myomectomy is believed to be a comparatively safe operation in selected cases. Hysterectomy should not be done unless necessary.

In atresia and septa of the vagina the septa should be removed if possible. Abdominal cæsarean section is the only method of procedure in some cases. The cases require good judgment.

In acute infection of the vagina and vulva gonorrhœa should be actively treated if present. The yeast treatment is mentioned as efficacious. The care of the infant's eyes is emphasized. In infection of the vulvovaginal gland, the gland should always be removed. D. H. BOYD.

**Hussey, A. A.: Management of Pregnancy and Labor Complicated by Heart-Disease.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 240.

The author discusses briefly the management of labor in cases complicated by heart-disease, reports six cases from his own practice, and offers the following suggestions:

1. The problem of the management of pregnancy and labor complicated by heart-disease must be solved independently for every case.



2. It is based, not on the character of the lesion alone, but upon the relation of the reserve force of the heart to the amount of strain which the pregnancy and labor under consideration will make upon it.

3. By the combined efforts of the experienced internist and obstetrician, much may be done, not only to reduce the immediate mortality, but to lessen the subsequent morbidity.

4. Operative deliveries are conservative in that they save the reserve force of the patient.

5. Sterilization is indicated more frequently than it is practiced.

6. An immediate mortality of 12 to 50 per cent, as is variously reported, is too high, and it is due to tardy recognition of the condition, unwise delay in terminating pregnancy, and the use of too conservative methods in the management of labor.

C. H. DAVIS.

### LABOR AND ITS COMPLICATIONS

**Salisbury, W.: Three Cases of Labor Obstructed by Ovarian Cyst.** *J. Obst. & Gynec. Brit. Emp.*, 1916, xxvii, 197.

The first case was that of a woman at term in her second pregnancy. She had been in labor six days, the membranes having ruptured two days previously. The child was dead with its head in the pelvic brim. The os uteri was fully dilated and a large tense cyst filled the pouch of Douglas. By laparotomy a dermoid cyst the size of an ostrich egg was withdrawn from the pelvis and enucleated, after which the abdomen was closed. The dead child, weighing 8.25 lb., was then extracted with the axis-traction forceps. Recovery of the mother was uninterrupted.

The second patient was cared for in her home by a midwife who felt a mass behind the vagina and the foetal head high up anteriorly. Pains were strong and a living child was born, the pelvic mass disappearing. Operation revealed a quantity of serum, blood, and mucoid material in the abdominal cavity. A semisolid multilocular cystadenoma of the left ovary was found to have ruptured. This was removed and recovery ensued.

In the third case, at the onset of labor the attending physician felt two polypi in the vagina. The full-term child was alive and presented by the vertex. Abdominally, a small cyst of the left ovary was found to move freely over the surface of the uterus. Dilatation had not commenced. In the pouch of Douglas a densely hard mass was continuous on the left side of the pelvis with a soft cyst. By laparotomy the pelvic mass was not readily accessible. The child was delivered by cæsarean section, whereupon the pelvis was found to be occupied by a dermoid cyst of the right ovary the size of a cocoanut. The left ovarian cyst was also of dermoid nature. Removal of the cysts was followed by recovery.

CAREY CULBERTSON.

**Ribas, G.: Present Conditions in the Treatment of Hæmorrhages Due to the Low Insertion of the Placenta** (Estado actual del tratamiento de las hemorragias en la inserción baja de la placenta). *Arch. de ginec. obstet. y pediat.*, 1916, xxix, 285.

When there is low insertion of the placenta hæmorrhages may occur not only during pregnancy and labor but also during the birth. The hæmorrhages occurring during pregnancy and labor can be prevented by obstetrical and surgical methods. Rest in bed, warm irrigations, laceration of the membranes, and the use of a Champetier bag are obstetrical methods which as a general rule suffice to prevent the hæmorrhages. The author does not recommend the use of tampons nor the Braxton-Hicks method. A tampon does not compress the placenta against the internal face of the uterus and consequently does not prevent hæmorrhage. The Braxton-Hicks method shows a foetal mortality of from 75 to 80 per cent. But in cases where the Champetier bag cannot be placed the Braxton-Hicks method can be employed.

In cases in which tocological methods either are not applicable or do not suffice surgical intervention must be resorted to. Dührssen's vaginal cæsarean operation, the classical cæsarean operation, or Sellheim's extraperitoneal cæsarean operation are the procedures applicable.

In such cases where intervention is indicated it is generally necessary to work rapidly, and the author thinks that the procedure which permits uterine evacuation in the least time is the vaginal cæsarean, and that this procedure will be the choice in most cases. The classical cæsarean is indicated when pelvic stricture coexists with the hæmorrhages. The extraperitoneal cæsarean operation is scarcely indicated and is reserved alone for cases in which together with a strictured pelvis there is a living infected retained foetus, a combination which is very rare.

Hæmorrhages which occasionally occur after the actual birth are due to atony of the zone of placental insertion. They must be distinguished from those due to a cervico-uterine laceration. Whenever a very extensive hæmorrhage occurs after the birth it is best to use Momburg's method. This procedure will give time not only to examine the patient but also to use adequate means to check the hæmorrhage.

W. A. BRENNAN.

**Rumbaugh, M. C.: A General Practitioner's Experience with Pituitary Extract.** *Penn. M. J.*, 1916, xix, 829.

From his experience with a series of 38 cases the author has arrived at the following conclusions:

1. Pituitary extract has a great influence on patients of a nervous temperament and their excitement is frequently calmed.

2. Its action on the unstriated muscle fibers decreases the necessity of post-partum catheterization.

3. As to the effect on the uterus, the contractions are rhythmical as in normal labor and not tonic as

some have described them to be. There is a shorter period of rest between the pains. The effect is noted in from four to ten minutes after the administration of the drug.

4. As to the effect on the child there seems to be nothing on record except a slowing of the heart-beat, where the passage is sufficiently large.

5. The placenta is usually expelled promptly after delivery of the foetus, usually within ten minutes.

6. It appears to exert no influence on the uterus to empty in cases of incomplete abortion and care should be taken in these cases in its administration, for knowing that a rise of blood-pressure follows, hæmorrhage will occasionally be increased rather than controlled.

The author advises that care be taken not to sterilize the hypodermic syringe by immersing it in alcohol, as alcohol seems to destroy the active principle of the extract.

W. D. PHILLIPS.

**Hill, I.: The Use of Chloroform in the First Stages of Labor.** *J. Am. M. Ass.*, 1916, lxvii, 559.

Full surgical anaesthesia, more or less prolonged and often repeated on successive days, as used by the experimentalists, does not represent the narcosis commonly used in obstetrics.

The author gave chloroform to animals in a manner similar to its administration in obstetrics and watched the results. Dogs and guinea pigs were anaesthetized in the following manner:

The animal was strapped to a board and given chloroform from a mask for thirty seconds (the period representing a labor pain). This was repeated every four minutes for two hours, every three minutes for one hour, every two minutes for one hour, and then the animal was continuously anaesthetized for a half hour. Some of the animals received the anaesthetic for one hour less than that and the complete final anaesthesia was omitted.

The animals were killed at intervals of two, four, and six days and the livers examined. Contrary to expectation, the same changes in the liver were found as described by Howland, Graham, and others, as well as the same tendency to rapid regeneration.

The study of these experiments, however, seemed to furnish the key to the mystery. It explained how women may be given chloroform in labor and never show symptoms or come to necropsy, while dogs and guinea pigs certainly suffer pathologic changes, at least temporarily.

Although planned theoretically to imitate the narcosis of childbirth, the anaesthetization of these animals did not in fact resemble it at all. The animals were strapped to boards, where they strained for a considerable period, until finally they became drowsy from exhaustion or somnolent from the effect of the anaesthetic. One 15-pound dog was given at times 25 drops at a dose on a closely-fitting mask to obtain some semblance of quietude. There was no euphoria in these animals.

In the author's experience practically all objec-

tions to chloroform on the ground of delaying contractions have disappeared since he has been using pituitary extract.

Bandler reports that more pituitary extract is necessary when chloroform is used. There need be no objection on that ground. A small percentage of each agent may be neutralized by the other. At all events, using one-half ampule of pituitary extract every twenty-five minutes during the administration of chloroform in small doses at each pain, the author finds that labor progresses rapidly.

His purpose has been to seek reassurance for the many who find chloroform satisfactory. He emphasizes the fact that chloroform in normal childbirth produces a distinct anaesthesia in which its effects are strengthened and supplemented by the influence of suggestion.

EDWARD L. CORNELL.

**McNeile, L. G.: Results From Pituitary Extract in Obstetrics, with Report of Case of Rupture of the Uterus Following Its Use.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 432.

The author states that the drug in his experience has not given satisfactory results when used in primiparæ. He has noted more tendency toward tetanic contractions of the uterus in primiparæ than in multiparæ. In a large proportion of cases these tetanic contractions have not been succeeded by normal rythmical contractions and the use of the drug has been followed by a low forceps operation. Again in primiparæ he has noted an extremely large number of cases in which the use of the drug has been followed by foetal asphyxia. In none of these cases, however, was the result fatal to the child.

The author does not believe that the drug is indicated in any case of toxæmia of pregnancy, particularly in the cases of pre-eclamptic toxæmia associated with high blood-pressure.

He has noted in several cases, particularly in those of prolonged labor and in multiparæ in which several pregnancies have followed in rapid succession, that post-partum atony of the uterus frequently followed the use of the drug, and in several cases an alarming post-partum hæmorrhage has resulted. From the observed results in the clinic he has formulated the following indications for its use:

1. Complete dilatation and effacement.
2. The membranes must be ruptured.
3. Presentation should be longitudinal.
4. In cephalic presentations there should be no deflection of the head, and the drug should only be used in vertex and breech presentations.
5. There should be no disproportion between the presenting part and the pelvis. Before the use of the drug the previous obstetrical history should be carefully considered and special emphasis should be paid to the consideration of any operative deliveries. An accurate knowledge of the internal pelvic measurements, of the contour of the pelvis, and of the measurements of the outlet is essential.
6. The presenting part should be completely engaged.



He considers engagement as being complete only after the greatest diameters of the presenting part have passed below the pelvic inlet. The term does not bear any reference to fixation of the head.

C. H. DAVIS.

### MISCELLANEOUS

Falls, F. H., and Moore, J. J.: The Value of the Wassermann Test in Pregnancy. *J. Am. M. Ass.*, 1916, lxxvii, 574.

This subject is discussed under three main headings: (1) its value from a sociologic point of view; (2) its value from a medical point of view; and (3) theoretical serologic considerations.

The serums studied were obtained in a routine examination of the cases in the obstetric ward of Cook County Hospital, Chicago, and a few from private hospitals. Blood was drawn at various intervals from the fifth week of gestation to the thirty-second day of the puerperium. In the majority of cases it was taken from the ninth month to term. In a few cases only the retroplacental blood was examined. In several cases foetal samples of blood from the cord and the mother's blood were examined simultaneously. In a few cases the Wassermann tests were repeated. The results were identical in all but one case. This was a case of eclampsia with several post-partum convulsions. The serum for the first test was obtained six hours after the delivery and was strongly positive. A second one made eighteen days later proved negative. No explanation of this is offered.

In all 160 women were examined. They ranged in age from 15 to 43 years, over 90 per cent being from 18 to 22 years of age. Eight nationalities are included in this group. The number of each with the percentage of positive reactions is shown in a table. Parity varied from 1 to 14, the majority being under 4. Only one gave a history of syphilis and 5 gave doubtful histories. Twenty-three had had previous abortions, varying from 1 to 4. Forty-four women were unmarried.

Of the series 18, or 11.3 per cent, gave strong positive reactions; 6 gave doubtful reactions, and not being repeated could not justifiably be classified as being syphilitic. Of 116 married women, 10.3 per cent were positive; of 44 single women, the positive percentage was higher, being 13.6 per cent. Among 23 giving a history of previous abortion 6, or 26 per cent, gave positive tests. All the positive results were on patients in the Cook County Hospital, as none of the patients from other hospitals who were included in this series had syphilis. These results are very close to those obtained in a series of Wassermann reactions on medical dispensary patients, a class of individuals of the same social status as those under discussion. In the dispensary series 13.6 per cent had positive reactions.

From the results of this series it would seem that the cases complicated by toxæmias and mental disturbances give a higher percentage of positive reactions. From the small number of cases in the

series the authors do not feel justified in drawing definite conclusions.

When we consider this fairly large percentage of pregnant women who have positive Wassermann reactions, who have improper treatment or none at all, and who are continuously bearing syphilitic offspring, it is open to serious question if the medical profession is doing its duty by such patients.

EDWARD L. CORNELL.

Sharpe, H. A.: The Urinary Diagnosis of Pregnancy. *J. Mich. St. M. Soc.*, 1916, xv, 334.

The author gives the technique of his urinary examinations in detail and draws the following conclusions:

1. In the ninhydrin reaction in a pregnant urine properly prepared we have a very reliable test of pregnancy.

2. A marked positive reaction indicates pregnancy, beyond a reasonable doubt. He has had a faintly positive reaction persist in a case of pregnancy for four months subsequent to confinement in a case of carcinoma uteri. He has had one positive reaction in a case of primary carcinoma of the bladder.

3. A negative reaction in a doubtful case is of more value in ruling out pregnancy than a positive reaction would be in confirming it.

4. The antitryptic action present in certain urines may, in rare instances, be due to other pathologic conditions.

5. The results of his experiments have been uniformly successful; cases tested during the second month and being negative subsequently were shown to be positive.

6. Placental substrate and ninhydrin may be secured, ready for use, from any of the large pharmaceutical houses.

7. What would be the possible value of a quantitative reaction — ninhydrin — in a case of threatened eclampsia? Is it not possible, with a quantitative test, that we have a method that may be of early diagnostic value in eclampsia?

D. H. BOYD.

Reder, F.: Drainage for Pus Conditions in the Pelvis During Pregnancy. *Tr. Am. Ass. Obst. & Gynec.*, Indianapolis, 1916, Sept.

According to Reder, the most frequent cause of pus accumulation in the pelvis during pregnancy must be attributed to a diseased appendix. A pelvic abscess is very insidious, with the exception perhaps of a subphrenic abscess. The reason for this is that the diagnosis of appendicitis is often obscured by pregnancy. If the pains and frequent indispositions which usually accompany the pregnant state are not closely scrutinized and promptly interpreted by the physician, the primary clinical picture of an attack of appendicitis may be readily overlooked, and only recognized when the more serious phases of the disease have manifested themselves.

Pregnancy does not in any way predispose to appendicitis. On account of the anatomic changes which take place in the pelvis during pregnancy, appendicitis may terminate in a pus formation more rapidly than in the non-pregnant state.

A close study of the symptoms of an appendix lesion during pregnancy may bring out some clinical points which differ from the usual clinical picture found in women who are not pregnant. For instance, before any pus formation has taken place, the pulse and temperature may show little or no change. The pain is usually located in the epigastric region and remains there until the disease has reached the stage when all pain ceases.

The triad douloureuse of Dieulafoy over the lower abdomen is often so obscured by other conditions that it is usually blurred, and its presence therefore lost. Even in an advanced pregnancy a readily recognizable rigidity of the right rectus is seldom encountered, and only exceptionally does palpation reveal a tender spot over McBurney's point. Nausea and vomiting, two alarming symptoms in an attack of appendicitis, count for naught during pregnancy because they are frequently associated with the toxæmia of the latter condition.

Pregnancy favors the rapid development of the pathologic stages of appendicitis, and a pus collection may be found in the pelvis in a very short time. In one patient, pregnant five months, a distinct fluctuation could be detected in Douglas' pouch by rectal palpation on the fourth day after a severe attack of "indigestion." This patient only felt indisposed for two days. On the third day she became very sick. No physician had been consulted before the third day.

Operative treatment of pus accumulations in the pelvis during pregnancy is very important. The danger involves two lives, and prompt intervention is demanded as soon as a diagnosis has been made.

The most satisfactory and convincing evidence as to the presence of pus in the pouch of Douglas can be obtained by a rectal examination. If the accumulation is considerable, no difficulty should be experienced in promptly detecting a fluctuating mass, even if the examining finger is inexperienced.

In the treatment of a pelvic abscess complicating pregnancy two factors become absolutely axiomatic: prompt recognition of the collection of pus and use of the simplest surgical measure for relief.

Surgery during the pregnant state must have its limitations, and they must be more respected in the later stage of gestation. An abdominal operation, for example, can be done with less risk of interrupting pregnancy before the fourth month than after. Furthermore, the thoroughness with which an operative measure during early pregnancy can be carried out is fraught with less danger than in the later stages. Great antipathy still exists as to attacking a pelvic abscess through the rectum, largely because of the likelihood of infecting the abscess cavity. This is remote inasmuch as it is one of Nature's ways of relieving the organism of a pus

accumulation in the pelvis. Patients relieved in this manner have usually suffered no untoward results and their recoveries have been satisfactory.

**Smith, G. F. D.: An Investigation into Some of the Effects of the State of Nutrition of the Mother During Pregnancy and Labor on the Condition of the Child at Birth and for the First Few Days of Life.** *Lancet*, Lond., 1916, cxc, 54.

The author's statistics suggest the following conclusions:

A state of bad nutrition of the mother at the time of labor due to insufficient food (1) greatly increases the percentage of stillbirths; (2) greatly increases the percentage of premature births; (3) slightly decreases the average weight of the full-term baby at birth; (4) definitely increases the post-natal infantile mortality; (5) has little, if any, effect during the first eight or ten days on the progress of babies who live during that time; and (6) possibly increases the death-rate of babies during the first three or four days of life.

A state of good nutrition of the mother at the time of labor, on the other hand, (1) considerably increases the average weight of the full-term baby at birth; and (2) increases the percentage of mothers who are able to suckle during the first eight or ten days of the puerperium, quite apart from any effect from the use of an ample diet during this time.

The figures also suggest that, on the whole, a state of average nutrition of the mother is the most favorable condition. EDWARD L. CORNELL.

**Acuna, M., and Foley, S.: Uncontrollable Vomiting of Lactation** (Vomitos incoercibles del lactante). *Semana méd.*, 1916, xxiii, 699.

The authors report two cases of infants each a few months old and nursed by its mother and in both of whom vomiting began without assignable cause when a few weeks old, becoming more accentuated as it progressed. Both infants died, the various therapeutic measures adopted to check the vomiting having failed. Autopsy showed no gastro-intestinal lesion, and in each case the pylorus was permeable.

The authors think that such uncontrollable vomiting occurring during lactation must have a constitutional origin transmissible by heredity — neuropathic predisposition of Finkelstein.

W. A. BRENNAN.

**Slemons, J. M.: The Results of a Routine Study of the Placenta.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 204.

The author gives a careful analysis of a study which he has carried out during the past few years. The results of this study are shown in the following recapitulation:

Gross anomalies.....	41 cases
Premature infants.....	17 cases
Maternal complications.....	10 cases
Question of syphilis.....	18 cases
Death of infant.....	33 cases
Placental bacteremia.....	4 cases



Recapitulating the results of the study of 600 placenta, it is found that approximately one of five or six specimens presented some departure from the normal or required examination to elucidate clinical manifestations on the part of the mother or the infant. Moreover, when the placenta was normal the pediatrician was interested in the fact, for this information made it more certain that the infant began life with a clean bill of health.

In well-organized clinics the careful study of the placenta should be insisted upon not only at the bedside but also in the laboratory. Such rigid requirements cannot be exacted of the practitioner, but if he wishes not to overlook important data he should supplement bedside observations with study of the placenta in his laboratory. It should be weighed and measured, gross abnormalities noted, fresh tissue teased, and the chorionic villi studied microscopically. These data should be recorded and thus become more reliable, if in the puerperium some complication should develop which would require for its interpretation a knowledge of the placenta.

When the teased villi suggest the presence of syphilis the placenta should be sent to a pathological laboratory and stained sections be prepared to establish the diagnosis. Simultaneously a Wassermann test upon the mother's blood should be made. Similar precaution is advisable if delivery occurs prematurely. At times a diagnosis of syphilis will be the result, but more frequently the investigation will remove all suspicion of that disease. Finally, if the infant is stillborn or dies within the first few days of extra-uterine life, the placenta should be as carefully studied as the organs at an autopsy.

**Chamorro, T. A.: Contribution to the Study of Hæmatology in Obstetrics** (Contribucion al estudio de la hematologia en obstetricia). *Semana méd.*, 1916, xxiii, 2 sem., 57.

Chamorro, who has made a lengthy investigation of the blood conditions in obstetrical cases in his clinics, arrives at these conclusions:

1. Pregnancy produces constant changes in the woman's blood. The most important modifications are leucocytosis, polynucleosis, and diminution of eosinophile. These modifications are increased during labor.
2. During labor an increase in the red globules is observed. Hæmoglobin and globular value are increased relatively the same during pregnancy.
3. Prolonged labors and those with pronounced pains produce a greater leucocytosis.
4. In the puerperium there is a diminution of hæmoglobin and red globules during the first days. Leucocytosis decreases in the course of the puerperium. It persists for about 21 days, its presence signifying a good prognosis.
5. Leucocytosis is more marked in primiparæ than in multiparæ. Polynucleosis is more marked in multiparæ. Prolonged labor with painful reaction shows the disappearance of eosinophiles.

W. A. BRENNAN.

**Fullerton, W. D.: The Significance of Syphilis in Obstetrics.** *Am. J. Obst.*, N. Y., 1916, lxxiv, 23.

After discussing the rôle played by syphilis in the tragedies of reproduction, the author suggests:

All physicians practicing obstetrics should become familiar with the signs and symptoms of syphilis in the placenta, foetus, and young children, as well as with the suggestive histories of the parents of such children. The history of every pregnant woman should be taken as early as possible in her pregnancy, and special emphasis should be laid on her past history relative to evidence of infection, such as genital sore, rash, sore throat, abortions, miscarriage, premature labor, or the birth of children dying early in childhood, or living with evidence of the disease. Whenever infection is in the least suspected, the patient should be carefully examined for evidence of the disease and a Wassermann made. In such cases the husband should also be examined, and if found infected he should be treated.

Every child born should be examined and watched for evidence of the disease. Every placenta should be weighed and examined macroscopically and a fresh teased portion microscopically for evidence of the disease.

Especially in obstetrical clinics, including both hospital and outdoor services, the same precautions should be taken, and careful examination of every placenta, both fresh and sectioned, should be a part of the routine laboratory work. Special staining for the troponema should be done whenever infection is strongly suspected, and thorough autopsies, whenever available, would be most instructive.

Every case showing evidence of the disease, either before or after labor, should be given thorough treatment.

C. H. DAVIS.

**Sever, J. W.: Obstetrical Paralysis, an Orthopedic Problem.** *Am. J. Orth. Surg.*, 1916, xiv, 456.

The author defines obstetrical paralysis as a paralysis produced during birth, and due to an injury to the nerves of the brachial plexus. The resultant paralysis is characteristic. The arm hangs limp at the side, the elbow extended, forearm pronated, and the whole arm inwardly rotated. The paralysis is usually flaccid.

He describes two well-defined types. The more common type consists of a lesion which involves the fifth and sixth cervical roots and the suprascapular nerve, and produces a paralysis of the muscles of the upper arm, only, with the exception of the supinators. This is called the "upper-arm type." The less common type, the "lower-arm" or "whole-arm type" is the result of injury not only to the fifth and sixth cervical roots, but to the seventh and eighth and possibly the first thoracic as well. Here the whole arm is flaccid; there is a wrist-drop and paralysis of the small muscles of the hand. There occurs also, rarely, the pure lower-arm type without any involvement of the upper cords of the plexus, the so-called "Klumpke's" paralysis.

The importance of unequal pupils is emphasized. This condition is overlooked in many cases. When present it means that through injury to the cervical sympathetic, definite injury is done to the plexus, either of the lower cords, the eighth cervical or first dorsal, which have communicating bands with the cervical sympathetic, or injury to the spinal cord itself, or to the fibers of the sympathetic system. The prognosis is not so good in these cases.

Under treatment the author divides the cases into two groups: those to be treated with massage and exercises, principally those of the upper-arm type, and those to be treated by operation on the plexus, usually those of the lower-arm type.

He recommends holding the arm in a plaster cast or by the use of a light wire splint, in an abducted, elevated, and outwardly rotated position with the hand supinated. Massage and electricity are of great help.

The technique of the author's operation is as follows: An incision is made on the anterior aspect of the arm and extending from the clavico-acromial joint to a point below the lower edge of the pectoralis major tendon. The tendons of the pectoralis major and subscapularis are divided. If outward rotation and abduction are not then free, the coracobrachialis or short head of the biceps are partially divided. Osteotomy of the acromion may be necessary in order to reduce a posterior subluxation of the head of the humerus. The pectoral and deltoid tendons are joined with interrupted catgut sutures and the skin closed. The arm is put up in a plaster cast extending from the crest of the ilium to the tips of the fingers, the arm being abducted, elevated, and outwardly rotated, and the hand supinated.

The cast is worn about two weeks, at the end of which time baking, massage, and exercises should be started.

The author concludes as follows:

1. Obstetrical paralysis is due to a stretching or tearing of the cervical roots of the brachial plexus and occurs as frequently in boys as in girls. It occurs more frequently on the right side.

2. The upper-arm type is more common.

3. It affects both arms very infrequently.

4. It is practically always associated with a difficult labor in which either or forceps have been used and in which force has been applied. Not uncommonly the baby is asphyxiated. Head presentations show the largest percentage of cases.

5. It may be rarely associated with fractures of the clavicle, but is not the result of a fractured humerus, or a dislocated shoulder.

6. The prognosis for a useful arm is good in the upper-arm variety and bad in the lower-arm type.

PHILIP LEWIN.

**Truesdell, E. D.: Posterior Dislocation of the Lower Humeral Epiphysis as a Birth Injury.** *Am. J. Obst.*, N. Y., 1916, lxxiii, 1065.

The author gives a very careful discussion of this subject illustrated with seventeen plates showing the

different types of dislocations. From a study of these cases he believes that the following conclusions are justified:

1. Forcible manipulations of the arms, necessary for the delivery in many cases of breech extraction with the arms extended over the head, may result in either a fracture of the shaft of the humerus, or a dislocation of the lower humeral epiphysis. In either case the arm will be found to hang limp at the side at birth.

2. Fracture of the humerus is indicated by a false point of motion at the center of the shaft of the bone, below the insertion of the deltoid muscle, which, so far as has been observed, is the invariable site of fracture of the humeral shaft of the newborn.

3. Dislocation of the lower epiphysis of the humerus is indicated in those cases where the arm dangles at the side at birth, where fracture of the shaft is eliminated by the absence of a false point of motion at the center of the shaft, but where abnormal mobility in a backward and forward direction can be produced at the elbow, the forearm held at a right angle to the arm. Distinct crepitus may be present with either condition, and as this crepitus is often the first thing discovered the diagnosis of fracture may be too hastily made.

Replacement of the dislocated epiphysis, so far as possible, should be attempted at once. Traction upon the arm with the forearm extended should be applied, and while this is maintained pressure from behind forward is made over the dislocated epiphysis. The forearm is then flexed to an acute angle and a Velpeau bandage applied for three weeks. Evidently the functions of the displaced epiphysis are not impaired by this injury, and the outcome of these cases is usually good.

C. H. DAVIS.

**Brown, A.: Blood-Transfusion in Hæmorrhage of the Newborn.** *Canad. M. Ass. J.*, 1916, vi, 716.

Transfusion is a safe and not complicated procedure and is to be recommended as the procedure in all cases of hæmorrhage of the newborn, for so far we are unable to judge the rapidity of hæmorrhage, and death has been known to take place in three hours following large extravasations. Other methods recommended may stop the hæmorrhage, but they do not give the infant the same chance for immediate progress.

The danger from hæmolysis is overrated and the injection of small air-bubbles has created no ill-effects. Fifteen cubic centimeters per pound of body-weight may be considered a safe amount to inject, which will approximately restore the amount of lost blood and stop the hæmorrhage.

EDWARD W. CORNELL.

**Kasahara, M.: The Curved Lines of Suction.** *Am. J. Dis. Child.*, 1916, xii, 73.

The curved lines of suction made by infants in good health are always regular and never discontinued.

When an infant in good health sucks and swallows,



milk the time ratio of the two acts is 1 to 2, or, rarely, 2 to 1.

In the case of a newborn baby, the curved lines of suction are discontinued now and then for physiologic reasons. In this case there is a certain pause between regular curved lines of suction.

Infants of premature birth or in atrophy make very irregular curved lines of suction and often discontinue them, but the lines gradually become regular again when the state of nutrition improves.

Certain diseases of the mouth, nasal catarrh, acute otitis, etc., make the curved lines of suction irregular, but they become regular again when the diseases are cured.

The curved lines of suction will become irregular when the temperature of milk is below 20° C. or above 40° C.

Idiots are unskillful in suction and in these cases the curved lines are always irregular.

EDWARD L. CORNELL.

**Field, J. A.: The Beginnings of the Birth-Control Movement.** *Surg. Gynec. & Obst.*, 1916, xxiii, 185.

The modern birth-control propaganda, commonly traced back to the decade of the seventies in England, has in reality a continuous history of a century. Malthus's "Essay on the Principle of Population" had called attention to the excessive propensity for reproduction, and had argued that the great source of misery and vice was to be found in over-population. But Malthus had offered no more practicable solution of the difficulty than the suggestion that the poor should remain unmarried and continent until they were in a position to support any children which might be born to them. Certain contemporaries of Malthus, less unwilling than he to question the traditional code of sex morality, boldly asserted that the true solution was to encourage early marriage, but by means of contraceptive methods to prevent the birth of children beyond their parents' power to support. As early as 1823 a definite propaganda was launched with the object of acquainting the English laboring classes with the justification of birth-control and the ways of accomplishing it. Before long, radical thinkers in the medical profession joined the neo-Malthusian movement. Knowlton of Massachusetts, in 1833, and Drysdale of Edinburgh, in 1854, published books on sex physiology in which birth-control was advocated and described. It was Knowlton's pamphlet which formed the ground for the notorious prosecution of Bradlaugh and Mrs. Besant in 1877—a prosecution which probably did more than anything else to hasten the spread of neo-Malthusian ideas.

The neo-Malthusian movement has been stimulated by opposition; but the hostility and disapproval which it has met have in a sense outlawed its leaders and have prevented the discriminating and scientific discussion which such a vital topic deserves. It is greatly to be desired that the best

judgment of the medical profession should be brought to bear on the momentous problems to which the control of conception gives rise.

**Yarros, R. S.: Some Practical Aspects of Birth Control.** *Surg., Gynec. & Obst.*, 1916, xxiii, 188.

The aim of the birth control movement is to remove all laws that interfere with the campaign of education dealing with the question of limitation of offspring.

The existing laws are constantly broken by some of our most intelligent and respected citizens. They obtain the knowledge and methods of preventing conception, either from physicians, or from books imported from Europe. But the bulk of our population needing the knowledge most has remained absolutely ignorant.

As to the need of such knowledge, physicians, nurses, and social workers are in the best position to testify. We know that hundreds of children are born every day into conditions which mean neglect, high infant mortality, insufficient food, poor education, with inevitable subsequent delinquency, vice, and crime. There are other thousands who are conceived against the will of both parents. In many of these cases the mother finding herself pregnant again, regardless of religious conviction, comes to the doctor's office with a heart-breaking story. Of course we refuse to perform abortion for good reasons, but they do not see them, and leave the office with a feeling of resentment against decency, which seems to them devoid of real human sympathy. They go to the quacks who perform the operation. There are thousands of criminal abortions performed every year with very serious results.

There are hundreds of other children born of parents with tainted heredity or acquired diseases such as syphilis, epilepsy, and insanity. Such children are burdens to themselves, families, and community.

Statistics show that the death-rate is greater among the poor families who have a large number of children.

The religious objection cannot be met because reasons have very little to do with religious conviction, but as to the moral one, anything that furthers the health and happiness of the individual, the family, and community cannot possibly be immoral. To urge that such knowledge would lead to greater sex immorality would mean to give too much importance to the feeling of fear of offspring and too little to the other real virtues, inherited and acquired.

There is little danger that such knowledge would lead to race suicide as seen from our studies of countries like Holland and New Zealand, which have possessed such information for many years. One of the strongest arguments in favor of such education is that it would no doubt lead to earlier marriages, a decided decrease in venereal disease, and no doubt would eventually abolish criminal abortions.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Loop, R. G.:** The Diagnosis of Certain Surgical Lesions of the Kidneys Based on Six Recent Cases. *Urol. & Cutan. Rev.*, 1916, xx, 427.

The author reports six interesting cases of surgical lesions of the kidneys in which clinical symptoms were misleading.

The first case was that of a young woman who had none of the usual symptoms of calculus yet two radiographs showed shadows in the left kidney and small calculi were removed by operation.

The second patient complained only of frequent and painful micturition. The ureteral catheter could not be passed on the right side and the radiograph showed an enlarged right kidney. The urine was negative for tubercle bacilli. Operation disclosed a large caseous kidney and a ureter completely solidified and infiltrated with lime salts.

The third case was that of a woman referred with a diagnosis of appendicitis. There were no vesical or renal symptoms and the urine was free from tubercle bacilli. Operation showed a diseased adherent appendix containing a concretion, and a kidney apparently totally destroyed by tuberculous infection. After nephrectomy the remaining kidney proved unequal to its task, tuberculosis of the lungs developed, and the patient died about four months later.

The fourth case was that of a young married woman with a freely movable kidney, palpable at times through the vagina; the urine was negative. There was a suggestion of Dietl's crises in her history and a record of repeated attacks of appendicitis. Operation showed a congested kidney, with dilated pelvis, and the appendix, tightly adherent, contained five appendoliths. The kidney seemed well worth saving and was accordingly anchored.

The remaining two cases represent that type which presents kidney symptoms but without kidney involvement, and both illustrate the value of modern diagnostic methods in so far as it has been possible to apply them. The first was a man referred for appendectomy. Examination disclosed no tenderness over McBurney's point but marked tenderness and pain over the right kidney and down the course of the ureter as far as the anterior superior spine. There were no urinary symptoms; radiography showed negative microscopic hæmaturia. The usual appendiceal incision disclosed a long, red, swollen appendix paralleling the ureter and densely adherent to the retroperitoneum. Its tip rested well up in the renal fossa.

The last was a young man with a typical history of renal colic. He had the paroxysmal attacks of

frequency, referred pain, local pain and tenderness, vomiting, absence of fever, and soreness afterward; radiograph negative, urine negative. Despite these findings an incision was made over the right kidney. It appeared perfectly normal and no stone could be felt by needling; the peritoneal cavity was opened and a chronically diseased appendix was found, retrocæcal, densely adherent, and containing a concretion.

The use of 15 per cent thorium solution in the renal pelvis would have been useful in these two cases, for it enables one to demonstrate the presence of uric acid concretions.

From a study of the literature and of these six cases the author believes the following diagnostic propositions are warranted: (1) Renal calculi may exist without symptoms or without classical colic and without hæmaturia or other evidence in the urine. (2) Renal tuberculosis may be primary; it may proceed to entire destruction of one kidney and to serious impairment of the other without marked constitutional symptoms; local pain may be entirely wanting or overshadowed by the bladder symptoms, painful and frequent micturition; pyuria and hæmaturia may be entirely absent owing to the complete occlusion of the ureter. (3) Chronic appendicitis may closely simulate right-sided renal calculi, rarely even to the extent of hæmaturia. (4) A complete study of these cases before operation is demanded, bringing to bear all the methods of exactness at our disposal, including radiography with or without injection of the renal pelvis, segregation of the urine by ureteral catheterization, and a thorough analysis, with functional tests and animal inoculations, when time permits, if the microscope fails to clear up the diagnosis, and cystoscopic examination of the bladder. T. DROZDOWITZ.

**Quiros, D.:** A Rare Form of Single Ectopic Kidney (Una forma rara de riñon unico y ectopico). *An. d. hosp. de San José, Costa Rica*, 1916, i, 211.

In the kidney described by the author there were a number of rare anomalies including some which he states have not been before described: (1) The kidney was unique. (2) Instead of being located as ordinarily upon the last dorsal vertebra, the kidney was situated with its pole upon the sacrovertebral angle and therefore completely ectopic. (3) The matter of its form was unusual: The form generally attributed to a unique kidney is the horseshoe form over the median line on the right side where it is generally found, sometimes with its concavity upward, or, as in the majority of cases with its concavity downward. The anomaly which is first in point of rarity is the coronary form. This form,



which may be called the cushion form, the author has never before seen, nor has he found any description of it. The kidney was roughly quadrilateral in shape, about 9 cm. x 10 cm. in size.

W. A. BRENNAN.

**Ashcraft, L. T.: The End-Results of Nephrectomy.**  
*Hahneman. Month.*, 1916, li, 565.

The report is based on the author's personal experience in 19 cases (12 tuberculous) extending over a period of seven years, the most recent case having been operated upon in November, 1915. The basis of success in nephrectomy lies in compensatory growth of the opposite kidney as pointed out by Tousson. At the early post-operative stage a condition resembling nephritis (diminished urine, albumin, and casts) sets in and is due no doubt to the toxic substances arising from the operative field. Later, hypertrophy of both interstitial and parenchymatous elements is observed, the latter in excess of the former. As a rule nephrectomized persons stand infections and are good operative risks provided care is used in the selection and application of both anæsthetics and antiseptics. Nineteen cases histories are given, with a careful analysis of end-results including urea, phenol-sulphonephthalein tests, pus, general urinary symptoms, gain in weight, etc. Some cases have recovered sufficiently to be able to earn a livelihood. The time intervening from the operation to the final report varies from seven years to three weeks, averaging three years. Of the 19 cases 6 have died: one from uræmia following influenza, one from suicide, one from pneumonia — all extraneous causes — one from sepsis following operation, one from pulmonary and one from miliary tuberculosis.

L. L. TEN BROECK.

**Friedlander, A.: Sarcoma of the Kidney Treated by the Roentgen Ray.** *Am. J. Dis. Child.*, 1916, xii, 328.

The author reports a case of sarcoma of the kidney occurring in a male child four years of age. The growth was too large to be removed, hence roentgen-ray treatment was employed. For a time there was marked improvement but later the tumor began to increase in size again. The report is of special interest as the result of the X-ray treatment could be studied at necropsy.

Treatments were given with a Coolidge tube. Three areas were covered at each treatment. Twenty exposures were made at intervals of about a week, with a dosage varying from 10 to 50 ma. seconds. The distance of the tube was eight inches, with a spark gap of nine inches.

Autopsy showed a sarcoma of the left kidney with small metastases in both lungs and in the liver. Of special interest is the pathologist's report of the examination of the tumor which follows. The capsule of the tumor was thick and hyaline like that seen in *Zuckergussleber*. The stained sections showed the most widespread and generally diffuse

necrotic changes with no evidence of inflammatory reaction. Even the stroma showed degenerative changes, associated with irregular areas of œdema. The parenchyma was almost completely necrotic and, except in a few areas, chiefly near the lower pole, showed almost no evidence of stricture. The remains of stroma and parenchyma could be discerned by means of the staining reactions, but all histological cellular structure was lost. Karyorrhexis and karyolysis were obvious and the general appearances suggested those seen in areas of diffuse caseation. On the other hand, the capsule of the whole tumor mass was hyaline, and, especially about the vessels, showed the structure of hyaline connective tissue. At no place was there any evidence of malignant cellular infiltration.

In the areas where some tumor structure persisted, the appearances were those of an alveolar sarcoma, and in these areas short spindle cells and round cells were present, chiefly the latter. In these areas the capillary vessels were healthy. About the margins of these tumorous foci the tumor cells and the interstitial cells were both changed. The former showed, first, pyknosis, and, as the areas of complete degeneration were approached, rhexis and swelling; the latter, œdema and vacuolization.

The fact that the whole necrotic process was so widespread in such a large tumor mass; that there was no evidence of vascular thrombosis in the main vessels and no evidence of infarction; and that the degenerative process appeared to be a gradually progressive one, indicates that the roentgen-ray treatments were at least partially the cause of the retrogression.

H. A. FOWLER.

**Walther, H. W. E.: Ureteral Calculi; Their Diagnosis and Treatment.** *Interst. M. J.*, 1916, xxiii, 675.

Primary calculus of the ureter is very rare. The calculus may form upon a stricture or upon an ulcer; in a pouch formed by the mucosa of the ureter or upon a foreign body in the ureter. Boyer reports a case of a pin in the ureter which became incrustated with salts. Walker reports a case of two ureteral calculi, the nuclei of which were silk sutures put in the ureter during operation. Stones in the urinary tract commonly originate in the calyces of the kidney where they may remain or pass to the renal pelvis, more or less obstructing the urinary outflow, possibly producing a hydronephrosis or pyonephrosis, or the stone may pass into the ureter. In 90 per cent of cases ureteral calculi are single. Multiple stones are sometimes found, one report stating that 47 calculi were removed from a single ureter. In 3.6 per cent ureteral calculi are bilateral. Calculi in the vesical portion of the ureter can often be palpated per vagina or per rectum. Stones so felt should be at least a centimeter in diameter, and should be situated within or immediately adjacent to the wall of the bladder.

While the finding of microscopic blood in the urine is not positive proof that ureteral calculus is



present, the complete absence of blood at repeated examinations is strong evidence of the absence of ureteral stone. Infected urines are encountered in about 70 per cent of cases. About 65 per cent of stones of the ureter can be demonstrated by radiogram. Cabot's suggestion to place an Edebohl's bag under the lumbar vertebrae so as to give obliquity to the lumbar spine while radiographing for stone in the lower ureter should be universally practiced. Geraghty and Hinman have reported cases of ureteral calculi composed only of the carbonates and oxylates of calcium which repeatedly failed to cast shadows. If the stone be low down there may be swelling or puffiness or hæmorrhages of the ureteral orifice.

To differentiate ureteral calculus from other obstructions of the ureter two methods are used: (1) The passage of a wax-tipped ureteral catheter to or beyond the obstruction, and examination of the wax coating for scratch marks. (2) The phonendophore of Cunningham may be used. When the metal bougie of this passes up the ureter, grating sounds may be heard when it comes in contact with the stone. About 75 per cent of stones which enter the ureter are spontaneously expelled.

The passage of calculi can be aided by inserting a ureteral catheter to or beyond the stone, and then attempting to dislodge the stone. Glycerine may be injected into the ureter. The ureteral probang inserted into the ureter, closed, then opened after it has passed above the stone and withdrawn, may dislodge a calculus. An injection of 5 ccm. of a 2 per cent solution of papaverine hydrochloride has been recommended, it being supposed that this drug relaxes the ureteral wall, and permits the stone to pass easily. The ureter may be dilated with various instruments. The choice of a skin incision, if operation is necessary, depends upon the location of the stone. The ureter should always be attacked extraperitoneally. For calculus in the upper third of the ureter the Mayo-Robson muscle-splitting is generally satisfactory. The Gibson incision for stones below the pelvic brim is probably the best.

B. S. BARRINGER.

**Walther, H. W. E.: Pyelo-Ureterography as an Aid in the Diagnosis of Obscure Surgical Conditions of the Kidney and Ureter.** *N. Orl. M. & S. J.*, 1916, lxix, 115.

The author reviews the early history of pyelography, describes his technique, and comments on the types of cases that require pyelography for complete diagnosis.

His technique includes the ordinary preparation for X-ray, cystoscopy, and ureteral catheterization. An opaque fluid, preferably thorium nitrate, is injected into the pelvis of the kidney by means of the gravity apparatus (which the author prefers) or by the use of a small syringe. In the author's opinion all pyelo-ureterograms should be made with the patient standing, as only in this way is it possible to get an idea as to the mobility of the kidneys and

other abnormalities that may exist and which would not show in a reclining position. In cases of so-called nephroptosis, especially in obese individuals, the author finds pyelo-ureterography the only means of making a diagnosis. By this means the presence of both kidneys can always be determined, and renal and ureteral anomalies, renal dilatations, and hydronephroses can be easily outlined. Differentiation of abdominal tumors from those of the kidney is easy by this means.

The author presents a pyelo-ureterogram showing two pelvic kidneys which he observed in his own practice and was able to diagnose before operation. He is able to differentiate ureteral stones from phleboliths by the use of a shadow-casting catheter and the making of stereoscopic roentgenograms. Reduplications of the ureters and crossings of the ureters are also shown in this manner. The author believes that pyelo-ureterography when carefully and properly performed in selected cases is free from danger, especially when opaque fluids in perfect solution are used and when the gravity method is employed for their introduction.

GILBERT J. THOMAS.

**Fowler, H. A.: Remarks on the Diagnosis of Renal and Ureteral Calculi.** *Maryland M. J.*, 1916, lix, 183.

The positive demonstration of a stone in the kidney or ureter does not satisfy the requirements of a complete diagnosis of this malady, according to Fowler. This much he considers merely as the first step. He believes it quite as important to determine the exact location of the stone in the kidney and ureter, as well as the number, size, and probable composition. The presence or absence of infection should be ascertained, the degree of damage done the affected kidney, and the condition of the opposite kidney.

The ease and facility with which a stone is removed when its exact location in the kidney or ureter is known and the character of the operative procedure best suited to the individual case depends largely upon reliable data furnished by pre-operative study.

The diagnosis is chiefly based upon the urinary findings, the X-ray examination, and cystoscopy.

Of the subjective symptoms pain is placed first. Urinary changes come second, according to Fowler. While he considers it hardly necessary to call attention to the importance of a careful microscopic examination of the urine as a routine procedure, yet he finds that this important detail is often neglected and frequently a normal appendix is removed under the mistaken diagnosis of appendicitis when the real trouble was stone in the right kidney or ureter. Hæmaturia is the third cardinal symptom of urinary stone.

In the X-ray examination of a patient with suspected stone in the upper urinary tract Fowler emphasizes the importance of the closest co-operation between the radiographer and the clinician. When



the X-ray is negative the use of the wax-tipped catheter, according to the technique of Kelly or Burton Harris, he considers extremely valuable.

H. W. E. WALTHER.

### BLADDER, URETHRA, AND PENIS

**Fullerton, A.: Injuries of the Bladder and Urethra in War.** *Brit. M. J.*, 1916, ii, 245.

The author comments on the fact that comparatively little attention has been given, especially since the war began, to wounds of the bladder and urethra. He outlines the manner in which these wounds may be produced and gives the signs and symptoms produced by such injuries. He then suggests methods of treatment of wounds of the bladder, both intra- and extraperitoneal, and cites cases to illustrate the points under discussion. In like manner he discusses the treatment of wounds of the urethra.

There have been two methods of treating wounds of the bladder at the casualty clearing stations: (1) the tying in of a catheter; (2) suprapubic cystostomy. Each of these procedures has a definite place in surgery, but the author thinks there is a want of appreciation in the minds of many operators as to the objects to be attained by these methods and the dangers attending their indiscriminate use.

Wounds of the bladder may be produced by bullets, shrapnel, shells, bombs, etc., and have certain dangers distinct from wounds produced in other parts of the body. The missile may reach the bladder from any direction and the tract is often long and tortuous. Complications may occur in the form of fracture of the neighboring bones, injury to large vessels and nerves and to the intestines, and extravasation of urine. A troublesome complication is injury to the rectum allowing feces to enter the bladder. These wounds may be intra- or extraperitoneal or both. Intraperitoneal wounds are more easily handled than extraperitoneal.

Signs and symptoms of wounds of the bladder vary with the position and size of the wounds and the concomitant injury to other organs. Intraperitoneal injury is usually associated with injury to the intestine with the usual signs of a ruptured viscus. All of the urine may go into the peritoneal cavity, none passing per urethra. If the wound is small, a cystoscope may help in the diagnosis.

Hæmaturia is usually present but, in the author's experience, should not be considered as a symptom of direct injury to the bladder. In extraperitoneal wounds the chief symptoms are escape of the urine from the wound, which may be delayed for several days, hæmaturia, and cystitis.

Wounds of the urethra are classified as of the pendulous portion and those of the fixed portion. The author does not discuss wounds of the pendulous portion. Wounds of the fixed portion are frequent and are produced by missiles which come through the buttock and through the thigh, or from the front or the back of the pelvis. Missiles passing transversely at the level of the great trochanter may in-

volve the prostatic portion of the urethra; those passing at the level of the middle of the small trochanter involve the bulbous portion; between these levels the membranous urethra is liable to injury. Concurrent injury of the rectum occurs frequently in anteroposterior wounds. Every degree of injury may be met with from slight contusions to complete loss. A fistula is usually present if the urethra has been severed.

Intraperitoneal injuries, which are ordinarily complicated by injury to the intestine, are usually dealt with by infolding or excision. The wounds of the bladder, if of moderate dimension, can be excised so as to bring fresh surfaces together. The author advocates the use of the thermocautery to sterilize the edges of the wounds. Foreign bodies should be removed from the bladder and from other places if easily accessible. The use of catgut is advised to avoid subsequent calculus formation, and continuous suture is recommended. If the wound to the bladder is large and cannot be brought together, it is advisable to attempt to render it extraperitoneal. In most cases of intraperitoneal injury the bladder has been completely closed, the peritoneal cavity cleansed, and a drain inserted into the rectovesical pouch. The author thinks it best to have the patient pass a catheter every four hours to avoid distention and advises against the use of the permanent catheter. There is not much danger of intraperitoneal leakage, in his opinion, if the peritoneal surfaces have been well turned in.

Extraperitoneal wounds are usually treated at the base hospital and ordinarily are not as simple as they at first appear. Where the rectum has been injured, a colostomy has to be done at once. The author advises transverse colostomy, the advantages of such procedure being: (1) the stoma is far removed from the wounded area; (2) the opening is easily controlled; (3) restoration of the continuity of the bowel is easily accomplished when the need for an artificial opening is past; (4) should it become necessary later to remove any part of a damaged rectum, the pelvic colon can be mobilized and brought down to supply the deficiency if it has not previously been interfered with by an inguinal colostomy. A case is cited in which a soldier had a severe extraperitoneal wound of the bladder which involved the rectum.

The author states that most of the men at the front have practically sterile urine, and it is much better to allow the clean urine to irrigate the wounds than to attempt other means of drainage or to attempt cystostomy. He contends, however, that properly conducted irrigation of the bladder is necessary so that the urine will not become foul. In cases in which there are large sloughs from the bladder it becomes necessary to do a cystostomy. He considers that suprapubic cystostomy does not completely drain the bladder and that urine can leak through wounds which are in the sides and base in spite of such drainage. When this does occur, it is usually the stagnant and infected urine from the

base of the bladder instead of the mixed urine which drains into the wounds.

The author removes foreign bodies from the bladder and makes a total closure if the wound has been intraperitoneal. When the wound is extraperitoneal he likes to try closure of the suprapubic wound with a drain in the space of Retzius and advises that close attention be given to the condition of the bladder; if the bladder becomes septic, it is best to open the suprapubic wound. Two cases are cited to illustrate the point that suprapubic drainage is not necessary and that non-interference is usually better than opening the bladder and attempting to drain.

The usual method of treatment of wounds of the urethra is the passage of a catheter through the urethra which is tied in place and, if this fail, suprapubic cystostomy. In the author's opinion, neither of these methods is the best that can be done for the patient. An indwelling catheter soon brings about urethritis and results in a suppurating wound with possible infection of the bladder or even of the kidney. Also, the catheter frequently becomes blocked and the urine cannot be voided. The author thinks that suprapubic cystostomy is unnecessary except in the presence of large blood-clots in the bladder. He suggests the following treatment for this type of injury. If the patient is unable to void, or if extravasation is liable to take place, peritoneal section is performed, blood-clots are removed, hæmorrhage stopped, and free drainage established. The patient is encouraged to pass his urine through the wound; if the attempted urination is unsuccessful suprapubic aspiration of the bladder is advised. After the sepsis has been controlled dilatation can be attempted and, later, plastic operations. As in wounds of the bladder, the urine passing through the wound cleanses it from its depths outward and the wounds heal quickly.

The author concludes with the statement that the views expressed will probably not meet with general acceptance, but that they are put forward to stimulate those who are dealing with cases such as have been described to consider each on its merits rather than to adopt any hard and fast rule for all.

GILBERT J. THOMAS.

**Bazy, L.: Treatment of Bladder Injuries by War Projectiles** (Sur le traitement des plaies de la vessie par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 1730.

Bladder injuries due to war are of two kinds, those with urinary retention and those in which the urine escapes easily by the trajectory of the projectile.

In wounds due to bullets there is generally retention, both the orifice and the projectile path being of small caliber and closing up easily by the elasticity of the tissues, the urine not being able to escape; but in wounds due to shells the breach is larger and the urine can escape easily. Where the vesical wound is accompanied by a bony fracture the situation becomes extremely complicated.

In two of the four cases reported by Bazy the bony parts were not involved. In the first a shell sectioned the inguinal canal and a hernial sac which was in it and tore the bladder. This man recovered without other intervention than the placing of a *sonde à demeure*. In the second case a shell penetrated above the pubis leaving by the right buttock. Catheterization was not possible. A median laparotomy showed the bladder distended. Bazy established a hypogastric fistula, but this patient had to be dismissed owing to the intensity of the bombardment.

The other two bladder injuries were complicated with skeletal lesions. In one the projectile entered the right buttock and escaped by the left. There was an extensive bladder wound complicated by a fracture of the neck of the left femur and of the cotyloid cavity. A large drain was placed in Retzius' cavity communicating with the bladder, the urine being withdrawn by a *sonde à demeure*. This prevented infection of the bladder from the fractured region. The patient recovered both from the bladder lesion and from the fracture.

The fourth case was somewhat similar to the last, but here the result was not so satisfactory; the patient died 36 hours after operation (drainage of Retzius' cavity).

From the first two cases Bazy concludes that when the bladder alone is involved and through its anterior wall only, treatment is simple and the prognosis favorable.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Derr, J. S.: X-Ray Localization of Foreign Bodies in the Eye by the Sweet Method.** *Am. J. Roentgenol.*, 1916, iii, 393.

The author believes that it is very rare indeed for a foreign body in the vitreous or ciliary body to become encysted and symptomless and give no further trouble. No means should be neglected to determine the presence or absence of a foreign body and its position in the globe.

Sweet's method is described in detail and the author agrees with Sweet that a splinter of metal of sufficient size to strike and penetrate the coats of the eyeball will be of sufficient density to cast a shadow on the photographic plate.

The technique is the most important part of the localization. No rifleman making a long shot has to line up his sights any more carefully than has the roentgenologist to adjust the sights of his localizer. A preliminary lateral roentgenogram should be made in every case to determine whether or not a foreign body is present, thus saving the inconvenience to the patient and the trouble to the operator of the localization should no foreign body be found.

The position of the body in the cornea or sclera is no indication of the situation of the foreign body in the ball. In general, metal bodies tend to gravitate to the lower part of the eyeball.

Sixteen cases are reported, with operative findings.

JAMES T. CASE.

**Vail, D. T.: Some Newer Principles in Dealing with Uncomplicated Cataract.** *Arch. Ophthalm.*, 1916, xlv, 307.

It is not presumed that there are unalterable procedures in the management of cataract, but the general principles as propounded in the classroom and the literature are discussed by the author.

Preliminary iridectomy is regarded as unnecessary and useless and therefore never indicated, as when vision is impaired to the degree that it would be justified according to the old teaching the time has arrived for the actual extraction regardless of the kind of cataract present.

Waiting for ripening is strongly deprecated because of the loss of time, health, and courage during this period, the cataract being regarded as ready for operation when the patient cannot see to work.

As regards cleansing the eye before operation the newer procedure is to simply douche the conjunctival sac with a large stream of warm normal salt, boric acid, or bichloride solution, the lids being held off the eye like a tent by a suitable speculum, exposing all parts of the sac to the action of the

fluid, and this form of speculum is most desirable during operation, removing the weight and spasm of the lids from the eyeball.

As it is the anterior capsule that causes post-operative mischief and disappointment a large portion must be removed by a capsule forceps, and as this cannot be accomplished by a cystotome the latter instrument is to be regarded as obsolete. No effort need be made to remove clear cortical fibers as they will be absorbed, it being only over-ripe lense material that is irritating. If cataract patients are old and infirm it is exceedingly important that the operation should be over as soon as possible. The anæsthesia should be sufficient in eight minutes and the operation completed in three to five minutes after that. Atropine after operation is taboo as the wounded eye is said to tolerate it badly.

A statistical table is given of forty cases of immature uncomplicated cataract in which the disc could be seen at the time of operation in all but three.

S. S. HOWE.

**Knapp, A.: The Operative Treatment of Partial Staphyloma of the Cornea and of Fistula of the Cornea with a Conjunctival Flap.** *Arch. Ophthalm.*, 1916, xlv, 359.

The author reports two cases of partial corneal staphyloma and one of corneal fistula, all with secondary glaucoma, which were treated by excision of the staphylomatous portion of the cornea, release of the adherent iris, with iridectomy and covering of the defect with a double pedunculated conjunctival flap, according to the method of Kuhnt. To restore normal tension, on which the success of the operation depends, the iridectomy must be done early, as soon as the inflammatory condition in the cornea permits, as in old cases the operation is generally not successful.

S. S. HOWE.

## EAR

**Crane, C. B.: Infections of the Ears, Nose, and Throat as Primary Foci for Secondary Infections.** *Laryngoscope*, 1916, xxvi, 1099.

The author mentions the following diseases which are attributed to primary foci in the upper respiratory tract and the ears, as well as the teeth; acute rheumatic fever, so called, often associated with chorea; endocarditis, acute and chronic; arthritis, acute and chronic; nephritis, acute and chronic; bronchiectasis; gastro-intestinal disturbances, such as ulcer and stasis; acute and chronic appendicitis; cholecystitis and cholangitis; myositis; tenosynovitis; neuritis, acute and chronic; septic iritis and irido-

choroiditis and acute thyroiditis, followed by chronically enlarged thyroid.

The streptococcus in some form is the usual infecting agent and the author lays stress on procuring the germ from the secondary focus when an auto-genous vaccine is to be made, because the strain from the secondary focus may be different from the strain in the primary focus, as has been shown by Rosenow's work on transmutation.

The author makes a plea for more careful examination in searching for the primary focus, because it is a very difficult thing to exclude infection.

OTTO M. ROTT.

**Loughran, R. L.: Streptococcus Mucosus Capsulatus Infection of the Mastoid Bone.** *Laryngoscope*, 1916, xxvi, 962.

Although bacteriologists are still uncertain as to where the streptococcus mucosus capsulatus should be placed in the classification of bacteria, there is no doubt in the mind of the otologist as to its great virulence and its insidious tendency to produce late complications in inflammatory ear disease.

Early and frequent bacteriological examination of all discharges in suppurative otitis media is necessary in order to determine the presence of a streptococcus mucosus capsulatus infection and by early operation attempt to stop its destructive course.

The author reports several cases illustrative of the "dangerous and insidious latent period" in inflammatory ear disease which has its origin in the activities of this infective agent. One patient developed sinus thrombosis two months after simple mastoid operation, and another a purulent meningitis after the mastoid wound had healed and the patient had been discharged. ELLEN J. PATTERSON.

**Blackwell, H. B.: Chronic Suppurative Otitis Media.** *N. Y. M. J.*, 1916, civ, 402.

The author describes the following modified radical mastoid operation, which he has performed in thirteen cases:

The usual postaural incision is made, as in the Stacke operation. The soft parts anterior to this incision are elevated and retracted forward; the cortex is removed with a gouge and the subcortical cells are curetted until the antrum is opened; the posterior bony canal wall is lowered and the antrum widened to its fullest possible extent. When the short process of the incus becomes visible the exter-

nal attic wall is removed by placing the back of the curette external to and in front of the incus and curetting from within outward. The bony canal wall is still further lowered until the facial ridge is reached, leaving only an epitympanic ring in its superior portion, with a width of about one-sixteenth of an inch.

In four instances this ring was removed in the superior and outer quadrant of the circle, leaving the membrana tympani and ossicles intact.

The granulations, polypi, and cholesteatoma, lying in the external and internal attic are removed by curetting internally or externally to the incudal body, care being taken not to destroy the suspensory ligament of the malleus or its external lateral ligament. In curetting near the incus, great care must be taken not to disturb the ligament which binds the extremity of its short process to the bone below and just in front of the external semicircular canal. The drum and ossicles are left *in situ*.

An L-shaped meatal flap is cut, as in a radical operation, the cartilage removed, and the flap sutured to the temporal fascia. The mastoid wound and attic region are packed snugly, thereby furnishing support to the flap, and the posterior wound sutured.

In summarizing his results the author states that the best results are obtained in cases having had a discharge less than five years.

He believes it is particularly indicated in cases of aural discharge of several months' standing, which have resisted treatment, and where the patient is threatened with the possibility of long-continued suppuration.

OTTO M. ROTT.

**Guttman, J.: A New Method of Opening the Drum Membrane in Purulent Otitis Media by Means of a Trephine.** *Laryngoscope*, 1916, xxvi, 1043.

The trephine consists of a four-inch hollow steel tube with a handle on one end and the lower end finely sharpened in the form of a circular knife 1 to 2 mm. in diameter.

After cleansing the ear canal with peroxide of hydrogen and alcohol, three to five drops of a 4 per cent solution of cocaine are injected hypodermically in the upper wall at the junction of the membranous and bony parts of the ear canal. After five minutes the drum is pierced with the trephine in the posterior quadrant. General anæsthetic may be used in sensitive patients and children.

ELLEN J. PATTERSON.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Clark, J. P.: Sarcoma of the Nose; Report of a Fatal Case, with Metastases in the Cervical Glands and in the Brain.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

A female, 64 years old, had noticed a swelling on her nose for four months. When first seen by the author it was about the size of a small marble. For a month there had been a slight bloody discharge from the nose. There was a dark purplish tumor visible on the outer wall of the left nostril just above the vestibule. The growth was completely removed. The microscopical diagnosis was either carcinoma or sarcoma. In two months a gland was felt under the left side of the jaw. This was excised and proved to be a spindle-cell sarcoma, thus determining the nature of the original growth. Seven weeks later a gland was palpable under the left sternomastoid muscle. Coley's treatment was tried, without apparent success for two months. At the end of that time a small recurrence was found in the nose and removed, and a month later a complete glandular dissection of the left side of the neck was successfully done. Three weeks later the patient developed mental symptoms, incoherent talk, convulsive attacks, motor aphasia, and dysphagia. At times she was very drowsy, and then restless and irritable. She soon lost power of locomotion and control of the sphincters. She became very comatose and hard to rouse, and ate practically nothing for the last ten days of life. An autopsy showed three metastases in the brain.

The most interesting features of this case are the metastases in the brain and cervical glands. The author could find but 8 reported cases of sarcoma of the nose in which metastases were said to have occurred. Of these cases 6 are somewhat doubtful leaving two, besides the case here reported, in which metastases occurred in the cervical glands, and only one other case in which they occurred in the brain.

OTTO M. ROTT.

**Kyle, D. B.: Removal of a Large Rhinolith, with Exhibition of Specimen.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

The case is reported of a male, aged seventeen years, whose right nostril was markedly obstructed by the septum, which was deflected and perforated by pressure from the body in the left nostril. This obstruction in the left nostril was found to be extremely hard, almost black in color, and covered by a great quantity of foul-smelling, mucopurulent secretion. This object was large enough to fill the entire naris; it forced the septum to the extreme

right, extending into the antrum, and could be felt projecting backward into the nasopharynx. It was freely movable and not attached at any point, pocketed as it were.

An operation was performed October 9, 1914, under ether anæsthesia. Attempts to remove the obstructing body in its entirety failed, owing to its large size and to the fact that it bore the relation to the surrounding bone structure of a ball to its socket. It was necessary to use heavy rongeur forceps, by means of which it was possible to break off small fragments from the granite-like mass. About one-third of the body was removed in this manner when the remaining portion was removed entirely, with only a slight tear at the nasolabial angle. The nose was packed with iodoform gauze. The entire operation occupied about one hour and considerable blood was lost. The patient was cyanotic and in shock when taken to the ward.

Twenty-four hours after operation a distinct pneumonic area had developed in the lower left lung, and the patient was removed to the medical ward for treatment of this condition, which cleared up in due time. During the four or five days following the operation considerable emphysema of the cellular tissue developed at the root of the neck and below the clavicles. The face was markedly swollen and the eyes puffy. By October 17th, a distinct abscess had developed at the inner canthus of the left eye. This was incised by Dr. Sweet, and found to communicate with the anterior ethmoid cells. This complication being relieved and the lung having become clear, the patient was returned to the special ward on October 19th, where he made an uneventful recovery, and left the hospital November 11, 1914.

OTTO M. ROTT.

**Clevenger, W. F.: Deviations of the Nasal Septum and the Submucous Operation.** *J. Indiana St. M. Ass.*, 1916, ix, 277.

After reviewing the subject of the physiological importance of proper nasal respiration and the results attendant upon nasal obstruction the author discusses the specific indications for radical surgical procedures on the deflected septum, mentioning:

1. Nasal occlusion persisting after the necessary measures have been resorted to for the correction of deformities of the arch of the superior maxillary bone after the tonsil and adenoid operation in the young.
2. Middle ear abnormalities, such as progressive eustachian tube inflammation and deafness.
3. Pain traceable to pressure in the middle turbinate region.
4. Vasomotor coryza.

5. Deficient voice resonance, and mouth-breathing in general with all its accompanying ill-effects such as bronchitis, laryngitis, pharyngitis, etc.

6. Other pathologic conditions resulting indirectly from deficient oxygenation, such as anæmia and reflexly such neurotic ailments as chorea, asthma, etc.

Contra-indications mentioned are:

1. In the young, under 15 years of age.
2. In the aged.
3. In a luetic.
4. All acute or subacute inflammatory middle ear affections.
5. All tonsillar diseases.

The author does not take up the technique of the work but he calls attention to the necessity of observing with due regard (1) the region of the bridge of the nose, where some cartilage must be left for a support; (2) the region of the cribriform plate where delicacy is imperative; and (3) to the juncture of the cartilage with the vomer where the attachments are firm.

OTTO M. ROTT.

**Sluder, G.: Surgical Consideration of the Upper Paranasal Cells.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

The procedure described has been satisfactory in the author's hands for ten years. It begins with a very high cut of the middle turbinate, called through "cribriform or infundibular turbinectomy." The cut is usually 2 or 2.5 millimeters from the cribriform plate, and may be extended to the most anterior limit of the infundibulum.

This very high cut may be carried backward to include the capsule of the ethmoid, under which condition not only is the middle turbinate removed, but the uppermost line, and usually all the other ethmoidal cells are opened wide into the nasal cavity. When desirable the entire anterior wall of the body of the sphenoid from its uppermost limits, may be removed. In the author's judgment and experience it is the technique that most often may be trusted to open all of the cells, regardless of unusual or anomalous positions.

There are many cells that are placed in positions more or less unusual that will be opened by a technique which has for its primary plan an incision which will skirt the cribriform plate and remove the middle turbinate at its most anterior as well as its most upper limit, and extend into the sphenoid body at its uppermost part, regardless of the natural opening, and then be extended downward until it has cut through its floor or found it to be impenetrable. The procedure of approaching the turbinate from above on its inner side is accomplished by the author's specially devised angular knife.

The intranasal surgery of the upper cells may be performed by this method in any part or the whole as conservatively or as radically as may be desired. The ability to place the incision safely two millimeters below the cribriform plate in any part of or in the whole of its extent seems to be the most

advantageous, and not a small part of this advantage is the power to extend this incision to the foremost limit of the infundibulum, thereby opening the inlet of the frontal to its widest natural possibilities. It is most desirable to preserve the natural inlet here, and this is done by a cribriform turbinectomy, which leaves undisturbed the histologic epithelial covering of the normal inlet; i.e., the uncinat process, the bulla ethmoidalis, the hiatus semilunaris, and infundibulum, regardless of the anatomic variations of the frontal inlet. Should these parts be wounded, as in a curettement, the resultant scar tissue blocks the inlet. The angle knife removes by cutting any desired tissue with the least possible trauma to the surrounding tissues. In the sphenoidal district it opens the uppermost and lowermost possible parts of the face, which has the advantage sometimes of opening also a postethmoidal cell which may occupy part of the body of the sphenoid. (Such a cell is often the cause of the entire clinical picture.) The angle knife is so small that it takes up the minimum room, and so leaves the small field open to the best vision possible. Its execution is always in the direction away from the danger zone.

OTTO M. ROTT.

**Berens, T. P.: Brain Abscess From Chronic Suppuration of the Frontal Sinus.** *Tr. Am. Laryngol. Ass.*, Washington, 1916, May.

In a previous communication the author reported a case of this affection, with a record of 49 other cases found in the literature.

Since then 6 other cases have been recorded, to which the following is now added:

A male, 30 years old, was operated on January 16, 1913, under gas-ether anæsthesia. The operation consisted in a radical external frontal and sphenoidal operation and opening of the antrum of Highmore through the naso-antro wall.

In December, 1913, as there was pus in the nose, the old wound was reopened through the nose and washed out. This had to be repeated in July of the following year. In December of the next year there was a recurrence of the discharge, and January 5, 1916, there was a large swelling of the cicatrix in the right frontal region accompanied by headache. The old wound was opened under anæsthesia; much pus flowed from the wound and also from the antrum which was opened. Granulations in the roof of the sinus hid a perforation which led to a cavity two and one-eighth inches from the roof of the sinus. This opening was gently enlarged, and a horse-hair drain placed therein. Finally, a soft rubber drain was inserted, and the discharge continued for five weeks. The wound was not allowed to heal for some weeks thereafter.

A culture from the brain showed streptococcus hæmolyticus in pure culture, and the same were found in blood culture in small numbers the day after the operation. Recovery was complete except that there was still considerable discharge of pus from the left nostril.

OTTO M. ROTT.



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